

McGraw-Hill Publishing Company, Inc.

May 26, 1927

Twenty Cents per Copy



Coal mined annually in this country
totals more than 600,000,000 tons

Upon the operating efficiency of
all mine equipment, largely
depends the economical
handling of this enor-
mous tonnage

The dependable and economical lubrication of all
mine equipment is an important part of the Vacuum
Oil Company's work. Our specialized knowledge
and correct oils are at your service.

VACUUM OIL COMPANY

Headquarters: 61 Broadway, New York. Branches and distributing warehouses throughout the country



New Departure Ball Bearing equipped electric motors were specified on this job because: First, annual lubrication is sufficient; Second,

motor feet can be mounted at the unusual angle shown; Third, the driven machines can be mounted closely together on the floor, as easy access to the motor is not necessary.

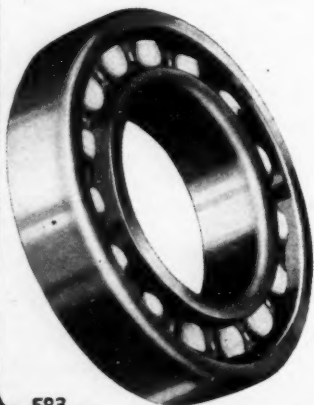
New Departure Advantages and Economies Are Money Savers in Electric Motors

Write for copy of "Cutting Your Costs," non-technical treatise on the application of ball bearings to electric motors; also, "Booklet K," technical treatise on the same subject. Either or both sent on request.

Electric motors equipped with New Departure Ball Bearings operate without friction and without wear continuously and uninterruptedly, requiring lubrication only once in 9 to 12 months.

Because of these superior advantages production is increased at a substantial reduction of maintenance cost, proving that New Departure Ball Bearings are more economical than any other type of anti-friction bearing.

THE NEW DEPARTURE MANUFACTURING COMPANY
Chicago Bristol, Connecticut Detroit



New Departure Quality Ball Bearings

FRANK H. KNEELAND
J. H. EDWARDS
SYDNEY A. HALE
JOHN M. CARMODY
Associate Editors
GEORGE J. YOUNG
Western Editor

COAL AGE

A. F. BROSKY, Pittsburgh
LOUIS C. MCCARTHY
FRANK J. G. DUCK
EDGAR J. GRALY
Assistant Editors
PAUL WOOTON
Washington Correspondent

With which is consolidated "The Colliery Engineer" and "Mines and Minerals"
R. DAWSON HALL, Engineering Editor

New Ideas Born as Users and Makers of Machinery Meet and Fraternize at Mining Congress	752
No Final Action Taken by American Mining Congress on Safety Code Project	756
American Mining Congress Sees in Well-Cleaned Coal, Mechanically Loaded, a Solution of Industry's Ills	758
Great Diversity of Equipment Shown at Cincinnati Convention	773
Central Pennsylvania Operators and Miners Open Peace Negotiations at Philadelphia in Hopeful Attitude	783
BY SYDNEY A. HALE.	
Recommendations to Renew Europe's Economic Health Formally Approved in Resolutions at Geneva Conference	785
BY E. J. MEHREN.	
Smith's Comment on Rate Structure Fraught with Deep Significance in View of Forthcoming Lake Cargo Decision	779
BY PAUL WOOTON.	
Editorial	751
News Items from Field and Trade	789
Among the Coal Men	792
Obituary	792
Weekly Review and the Market	793
Foreign Market and Export News	798
New Equipment	799

McGRAW-HILL PUBLISHING COMPANY, INC.

Tenth Avenue at 36th Street, NEW YORK, N. Y.

NEW YORK DISTRICT OFFICE, 235 Madison Ave. Cable Address: "Machinist, N. Y."

WASHINGTON, Colorado Building
CHICAGO, 7 South Dearborn Street
PHILADELPHIA, 1600 Arch St.
CLEVELAND, Guardian Building
ST. LOUIS, Bell Telephone Building
SAN FRANCISCO, 333 Mission Street
LONDON, 6 Boulevard Street, E. C. 4, London

JAMES H. MCGRAW, President
JAMES H. MCGRAW, JR., V.-P. and Treas.
MALCOLM MUIR, Vice-President
EDWARD J. MEHREN, Vice-President
MASON BRETTON, Vice-President
EDGAR KOBAK, Vice-President
C. H. THOMPSON, Secretary

The annual subscription rate is \$3 in the United States, Canada, Mexico, Alaska, Hawaii, the Philippines, Porto Rico, Canal Zone, Cuba, Honduras, Nicaragua, Dominican Republic, Salvador, Peru, Colombia, Bolivia, Ecuador, Argentina, Chile, Spain, Panama, Brazil, Uruguay, Costa Rica, Guatemala, Haiti and Paraguay. Extra foreign postage \$3 (total \$6 or 25 shillings). Single copies, 20 cents. Change of Address—When change of address is ordered the new and the old address must be given. Notice must be received at least ten days before the change takes place.

Copyright, 1927
By McGraw-Hill Publishing Company, Inc.

Published weekly
Entered as second-class matter Oct. 14, 1911, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

Printed in U. S. A.
Member Audit Bureau of Circulations
Member Associated Business Papers, Inc.

Number of copies printed this issue, 9,733

Publishers of
Coal Age
Engineering News-Record
Power
Ingénieur International
Bus Transportation
Electrical World
Industrial Engineer
Engineering and Mining Journal
American Machinist
Chemical and Metallurgical Engineering
Radio Retailing
Electric Railway Journal
Construction Methods
Electrical Merchandising
Electrical West
(Published in San Francisco)
American Machinist—European Edition
(Published in London)

Small Changes Sometimes Pay Big Dividends

MANY and many a mine is laid out with all possible skill at the time it is installed. After a few years conditions change—the mine becomes developed entailing new duties on management, equipment and trackage. It is then that skill equal to that required in making the original layout is necessary if the plant is to be reconditioned in such a way as to secure most efficient results from the equipment available.

Next week *Coal Age* will carry an article showing how a few little changes enabled the hoisting capacity to be materially increased at an operation that was justly considered modern in every respect. There are doubtless many mines throughout the country where similar or at least comparable changes might bring equally beneficial results.

INFORMATION OF INTEREST TO COAL MEN

Facts about coal are always interesting to coal men. Next week also George H. Ashley, state geologist of Pennsylvania, will give *Coal Age* readers some highly interesting facts concerning coal and coal mining in all parts of the world. Mr. Ashley's long experience enables him to speak with authority on this subject. He speaks of the thickest coal, the thinnest coal, the deepest shaft, the oldest known mine and like topics. His paper contains a wealth of information that is sure to be welcome.

The Reasons for Better Service

①

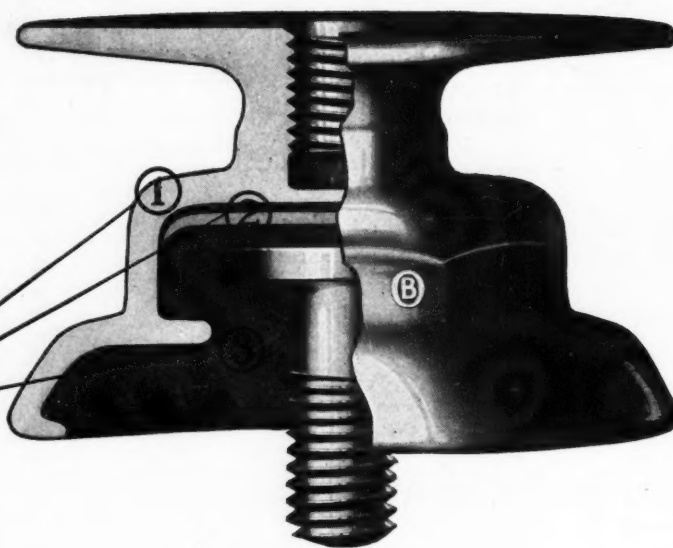
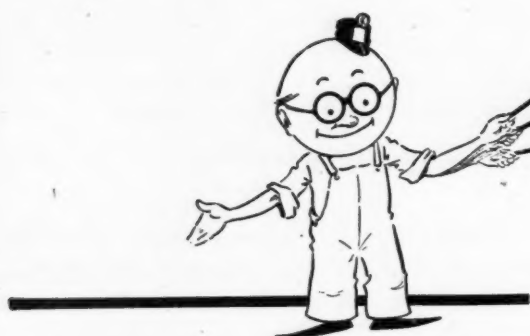
The heavy outer shell of O-B Flecto hot dip galvanized malleable iron means a strong rigid durable hanger. One that enjoys a long life of service; to be used over and over again as lines are retired and extensions are built.

②

An extra precaution against current leakage is found in a mica disc inserted between hanger shell and stud bolt.

③

Thoroughly insulated with O-B Dirigo Insulation which gives great electrical and mechanical strength. It resists the effect of cold and heat, is non-absorbent and unaffected by chemical action.



"Gone Are The Days"

ONCE upon a time, sound trolley construction in mines was not as important as it is today. But with the tremendous growth of business, higher labor costs and increased competition, came a greater and greater demand on the mining industry. So mining men began to realize that to meet these demands, greater production with greater economy must be had.

This realization brought just doom to the hap-hazard methods in trolley construction. An appraising eye was cast on the vast net-work of trolley and feeder over which production must move. Here was a vital element in the chain of production operations; it must not clog. Any delay here would indeed prove costly.

Better trolley equipment was the demand that followed. Engineers began to look at

mine hangers in an altogether different light. The hidden construction details were found to be of vast importance, for on these details depended the life and service of the hanger.

These men then made valuable suggestions which have been embodied in all O-B Mine Hangers. Their ideas, their problems have gone into the construction of these hangers. Today, on the firing line of greater production and greater economy you will find O-B Mine Hangers in the thick of the battle, giving that steady, reliable service which means so much to you in greater production and fewer hanger replacements.

The hangers best suited to your particular operating conditions will be found on pages 484 to 496 of the big blue covered O-B Catalog No. 20. Have you a copy? If not, one will be gladly sent at your request.

Ohio Brass Company, Mansfield, Ohio
Dominion Insulator & Mfg. Co., Limited
Niagara Falls, Canada
403M

Ohio Brass Co.

SALES OFFICES: NEW YORK CHICAGO PHILADELPHIA PITTSBURGH CLEVELAND SAN FRANCISCO LOS ANGELES

PORCELAIN
INSULATORS
LINE MATERIALS
RAIL BONDS
CAR EQUIPMENT
MINING
MATERIALS
VALVES

COAL AGE

McGraw-Hill
Publishing Company, Inc.
James H. McGraw, President
E. J. Mehren, Vice-President

Devoted to the Operating, Technical and Business
Problems of the Coal-Mining Industry

R. Dawson Hall
Engineering Editor

Volume 31

NEW YORK, MAY 26, 1927

Number 21

The Man and the Machine

NOWHERE has the world seen a finer demonstration of perfect co-ordination of man and machine than that given by the incomparable Lindbergh. His achievement stands out as one of the most thrilling adventures of all time. As one reads Captain Lindbergh's own story of his flight, told with rare charm and simplicity, he is conscious of Lindbergh's sense of indebtedness to that splendid mechanism that made success possible. Back of this achievement lies years of thoroughgoing research and experimentation.

GUIDED by a wholesome inheritance the boyish Lindbergh took up the threads of aviation wherever he found them and applied his intelligence to complete his knowledge of the art and the science of flying. Out of his understanding of the elements of his working field—the air—and of his working instrument—the machine—he built patiently toward ultimate success. Perfect co-ordination!

THE CABLE and the radio bring us this story just as the American Mining Congress closes its most successful convention. Here again in Cincinnati was driven home to the great basic coal industry the necessity and value of co-ordinating man power and machine power. The program was dedicated to an analysis of progress made in the application of machine power to the mining and preparation of coal.

IT was a working convention. Operators came to learn how machines could improve their quality and reduce their costs. Manufacturers were eager to show how intimately they had studied the needs of operating men and how well prepared they are to provide equipment designed to accomplish the results desired. This interrelationship between the operators and the manufacturers is better understood today than ever.

THE machine has arrived. It remains now for the operator to develop through careful management the necessary co-ordination of his man forces with machines of production. The manufacturers of coal-mining equipment have demonstrated their ability and their desire to serve the operator. They, too, have arrived. The convention emphasized, through exhibit and program, that the coal industry is in the process of making great strides in economy and quality of production. It is off to a new start.

ALL praise to the American Mining Congress, its officers and associates who made this meeting possible and to those manufacturers and operators who inspired the Congress to a new appreciation of how rapidly the industry is moving toward completer mechanization. The coal industry in the midst of this drama of co-ordination of men and machines salutes the great Lindbergh and his almost human machine.

New Ideas Born as Users and Makers of Machinery Meet and Fraternize at Mining Congress

THE COAL INDUSTRY went to school again last week for another post-graduate review in the latest advances in management and mechanization designed to enable the coal mines of the country to better serve the great American public.

For four days, operating officials from chief executives down to master mechanics and foremen thronged the Music Hall at Cincinnati, Ohio, to listen to the program of the Fourth Annual Convention of Practical Operating Men and to study the exhibits of the National Exposition of Coal Mine Equipment, held under the auspices of the American Mining Congress.

They came singly and in groups to learn how to prepare a better product for the consumer, reduce production costs through greater mechanization and more efficient operating practices and to make the task of winning the coal less hazard-

ous for the men who toil underground. They heard men who already had put the newer machinery to practical test describe the results of their experiments. Then they swarmed out into the two wings of the building which housed the exhibits to see the new equipment which had made progress possible.

DELEGATION 35 STRONG

One large bituminous producing company thought so much of the convention and exhibition that it had a delegation of 35 men in attendance. Parties of ten and twelve were common. Members and visitors gathered by the hundreds in the auditorium of the hall to hear fellow operating officials discuss the most recent developments in preparation, mechanical loading, safety, cutting and blasting. So keen was the interest that meetings ran far beyond their scheduled time. At the close of each session little knots of eager men surrounded

the speakers and subjected them to a friendly fire of questions.

All day long, from Tuesday morning until Friday afternoon, the delegates streamed up and down the aisles of the equipment exposition. A rail clamp caught the eye of one operator; another visualized the possibilities of a portable electric saw for cutting mine timber; a third examined the new 20-ton locomotive built for the Bertha-Consumers Co. and commented on the trend toward railroad practice in mine locomotive design.

Pumps, automatic substations, vibrating screens, models of coal-cleaning plants, switches all claimed attention. Loading machines were a special center of interest to men who were considering the question of whether they should install such equipment now or wait until more adventurous competitors had taken the lead. Booths showing the newest in safety devices were not neglected.



"Uncle" Jerry Morrow

The head of the Morrow Manufacturing Co. was probably the dean of the coal men at the Cincinnati convention. Born 84 years ago, Mr. Morrow has been connected with the coal industry for 52 years. He started in the Wellston district with one miner in the days when mining machinery was still largely in the dream stage. In recent years "Uncle" Jerry has been devoting his attention to manufacturing. He served in the U. S. Navy during the Civil War.



James F. Callbreath

The secretary of the American Mining Congress has so thoroughly identified himself with the work and the success of that organization that it is almost impossible to think of the Congress without thinking of Mr. Callbreath—in fact the next glossary of mining probably will make the terms synonymous. Mr. Callbreath has been guiding the destinies of the Congress since 1904. Not the least of his achievements is the annual Cincinnati convention and exposition.



Dr. Henry Mace Payne

As consulting engineer and right-hand aid to Secretary Callbreath, Dr. Payne is kept busy in office and field work for the American Mining Congress. In recent months he has been devoting considerable time to arousing public interest in the mineral resources of the South and now acts as secretary of the Southern Division of the Congress. Dr. Payne, who is well known to the coal industry, was very much on the job during the Cincinnati convention.



Ezra Van Horn

"First catch your hare" is an old rule in successful game culinary art. Mr. Van Horn, who was chairman of the program committee of the Cincinnati convention, evidently has taken that rule to heart for he was able to assemble a battalion of worth-while speakers and report the minimum number a.w.o.l. When not arranging convention programs or sitting in on wage conferences, Mr. Van Horn is busy as general manager of the Clarkson Coal Co.

**N. S. Greensfelder**

Real history in coal mining equipment expositions began in 1924 at Cincinnati when the American Mining Congress and the National Coal Association met simultaneously on the banks of the Ohio. The task of directing the 1924 exhibit fell to the lot of N. S. Greensfelder, of the Hercules Powder Co., who can now look back and rejoice in the growth of the show. Mr. Greensfelder is one of the two honorary chairmen of the Manufacturers' Division.

**Col. Warren R. Roberts**

Wherever and whenever standardization of mining equipment or mining practice is discussed the name of Col. Roberts comes to the fore. As chairman of the general coal committee of the Standardization Division of the American Mining Congress, it has been his job to coordinate the work of the various subcommittees, help in their organization and speed them on to a completion of their labors. Col. Roberts is president of the Roberts & Schaefer Co., of Chicago.

**H. K. Porter**

As chairman of the Manufacturers' Division of the American Mining Congress, Mr. Porter headed the group that was responsible for selling the idea of an exhibit to the manufacturers of coal mining equipment. An increase of approximately 25 per cent in the exhibits testifies to the success of the efforts of Mr. Porter and his associates. Mr. Porter, who is connected with the Hyatt Roller Bearing Co., was re-elected chairman of the division at a meeting last week.

**L. W. Shugg**

When the old exposition manager resigned a short time before the new show was to be staged, a cry went up from Jericho to Schenectady for help and L. W. Shugg of the General Electric Co. responded to the call. After his performance at Cincinnati last week some of the other members of the Manufacturers' Division of the American Mining Congress are wondering why they were ever worried. His associates expressed appreciation at luncheon May 19.

**A. W. Dickinson**

The general superintendent of the Union Pacific Coal Co. was called upon last week to do what is known in professional circles as "doubling in brass." He was chairman of one of the sessions devoted to mechanical loading and also gave a stereoptican talk on loading machines. Coming from operations which have attracted nationwide attention, Mr. Dickinson was unabashed by the double duty thus thrust upon him.

**Major W. Clay Hepburn**

American coal operators have learned much from European mines in the past. Europe is returning the compliment by sending over delegations of mining engineers to study how we do it on this side of the waters. There were several British coal men at the convention in Cincinnati last week. One of these was Major W. Clay Hepburn, who believes that progress is promoted by visits to other mines and by free interchange of opinion.

**H. A. Busby**

The president of the Keystone Lubricating Co. is one of the most active members of the Manufacturers' Division of the American Mining Congress and his work has been recognized by his election and re-election as a vice-chairman of the board of governors of the division. Mr. Busby is busy planning how to make the Cincinnati show still more successful in the years to come and how best to widen its appeal to practical coal operating men.

**C. L. Herbster**

An exposition which attracts an attendance of over 3,000 practical coal operating men is bound to keep those responsible for the success of the show on the jump. So C. L. Herbster, of the Hockensmith Wheel & Mine Car Co., who is one of the vice-chairmen of the board of governors of the Manufacturers' Division of the American Mining Congress, was no friend of idleness yet worked with unruffled good humor.

**F. J. Maple**

One reason the coal mining show of the American Mining Congress is so successful is the fact that the manufacturers who assume the responsibility for putting it over know the ropes. Take F. J. Maple, of the John A. Roeblings' Sons Co., one of the vice-chairmen of the Manufacturers' Division. Like his associates on the board of governors, Mr. Maple was modest to the point of reticence in discussing his own achievements: "the show's the thing" seemed to be their motto.

**Joseph D. Zook**

The vice-president and general manager of the O'Gara Coal Co., who was chairman of one of the sessions devoted to coal preparation, entered the coal business via the railroad route. Prior to joining the O'Gara Co., Mr. Zook was connected with the traffic department of the Chicago, Burlington & Quincy R.R. His natal day—but not the year—is the same as that of Thomas A. Edison—and it is a matter of history that both began their careers at the telegraph key. A bridge player? Well, yes.

**Robert M. Lambie**

Have you seen "Bob" Lambie? We addressed a West Virginia coal operator in Convention Hall. "No," said the operator, "I don't see how he can have energy left for Cincinnati after all the rescue work he has been through during the past few weeks." But "Bob" came. Hosts of friends greeted him. They always do wherever he goes. There is something genuine about the chief of the Department of Mines of West Virginia that appeals to the men in the coal industry in every state.

**Erskine Ramsay**

There must be something in heredity. The father of Erskine Ramsay, chairman of the board of the Alabama Coke Corporation, sunk the first shaft mine west of the Allegheny Mountains. The son, who has been identified with Southern mining operations for over thirty years, also has been a pioneer in the construction and development of new processes and new equipment, including the first multiple-car or trip dumper, which was built by the Tennessee Coal, Iron & Railroad Co.

The miniature coal-dust explosions staged by the U. S. Bureau of Mines as part of its campaign to spread the gospel of rock dusting did not escape notice.

Some operators came to the convention seeking light on one special problem. Others were on the lookout for anything which might improve their processes and reduce costs. They went slowly from booth to booth, eager to learn what the 120 manufacturers serving the industry had to offer. They came from every important coal-producing district in the United States and from abroad.

"UNCLE" JERRY MORROW

There were grey-beards like "Uncle" Jerry Morrow, who started in the industry in Ohio 52 years ago with only one miner. "Uncle" Jerry, serene with the calm of his 84 years, looks back on the developments in merchandization from the dim days when all labor was physical and the pick and shovel represented the bulk of the coal-mining equipment. And because the industry has traveled so far, he is sure that it will travel still farther.

Then there were the younger men, some of them fresh from the labora-

tories of the experiment stations and the mining schools, crammed with the newer technique and a little impatient, perhaps, of remeasuring the water already over the dam. To them most of the improvement in methods and equipment discussed at the convention were an old story. They were straining to press forward to greater achievements.

But whether veterans or juniors in the service every man present was fully alive to the fact that the industry is running a race between the increased costs involved in turning out a finer product from the topworks and the reductions possible in underground costs through the wider use of mechanical equipment, especially the loading machine, and the greater employment of the factory principle of planned production.

The demands of the public, it was pointed out in the sessions devoted to the consideration of preparation, are becoming more exacting. The day of selling coal "as is" has vanished. Wartime conditions taught the industrial consumer much-needed lessons in the more efficient utilization of fuel. Competition between coals and between coal and other forms of fuel in both the domestic

and industrial divisions of the trade has forced the demand for higher standards of sizing and of cleaning.

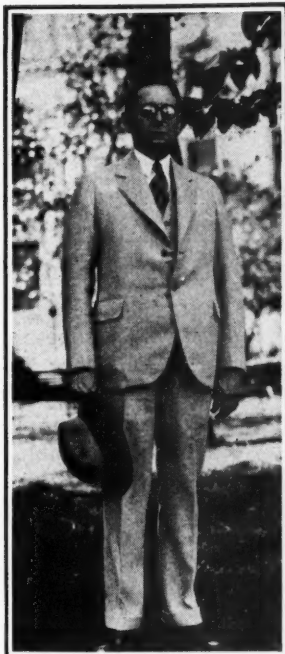
As a result, bituminous coal, no less than anthracite, is rapidly becoming a custom-tailored product. The producer who hopes to survive the competitive scramble must know intimately the requirements of his customers as to size, ash content and other factors. He is faced, too with the problem of deciding whether the additional cost necessary to prepare the coal in the manner which will win the attention of the consumer can be added to the selling price or whether it must be absorbed in reductions in production costs in some other direction.

SOME DOUBT EXPRESSED

Some of the speakers seemed in doubt as to the possibility of putting the increased cost where it belonged. But this was not the universal view. J. William Wetter, general manager of the bituminous operations of Madeira, Hill & Co., pioneers in the adoption of the sand flotation process for the preparation of bituminous coal, speaking from the experience of 19 months' operation, during which the Rockhill mines had shipped over

**W. L. Robison**

As vice-president of the Youghiogeny & Ohio Coal Co., Mr. Robison directs coal-mining operations in three states. He is intensely interested not only in economical operating practices, but in safe operating practices, and presided over the session of the Cincinnati convention devoted to the subject of safety in coal production. When not enmeshed in the problems of running the Y. & O. properties, Mr. Robison is known to swing a wicked and steady club on the links.

**J. C. Wilson**

Not even a sprained ankle, received while alighting from a taxi in front of the Gibson Hotel, could keep J. C. Wilson, of the Ohio Brass Co., away from the Cincinnati Music Hall last week. Mr. Wilson, who headed the Manufacturers' Division in 1925 and 1926, was too interested in the success of the show to let personal discomfort long interfere and his return to active duty was joyfully hailed. Mr. Wilson is an honorary chairman of the board of governors of the division.

**Dr. A. C. Callen**

Engineer, teacher, editor, presiding officer, Dr. Callen. With interests and sympathies as broad as his broad shoulders, Dr. Callen is looked for quite naturally at every important meeting of coal mining men. His background of experience in West Virginia and in Illinois makes him a much sought after chairman. To him prompt adjournment is as important as prompt opening. This tends to speed up the meeting and hold attention close.

**Dr. J. J. Rutledge**

The genial chief mining engineer of the Maryland State Bureau of Mines needs little introduction to *Coal Age* readers who have followed his career for the past thirty years. He has combined to an unusual degree the work of the practical operating official at the mine and research investigation as an independent consulting engineer and geologist and as a member of the technical staff of the U. S. Bureau of Mines. Dr. Rutledge presided over one of the sessions on coal preparation.

1,000,000 tons of coal prepared by this process, was emphatic in his declaration that the preparation had been a commercial success. The better preparation, he declared, had brought wider markets and increased prices.

The respective advantages of the wet and dry cleaning processes, sand flotation, pneumatic separation and the older types of screening were thoroughly discussed by the various speakers at the sessions presided over by Howard N. Eavenson, H. N. Eavenson and Associates, Pittsburgh, Pa.; Dr. J. J. Rutledge, chief mining engineer, Maryland State Bureau of Mines, Baltimore, Md., and Joseph D. Zook, vice-president and general manager, O'Gara Coal Co., Chicago. The various papers presented are reviewed in greater detail elsewhere in this issue of *Coal Age*.

Three sessions were devoted to mechanical loading. That this is a subject in which increasing numbers of coal operators are taking a deep interest was indicated by the large attendance at the meetings and the consideration given the exhibits of loading machines. Indeed, one operator expressed regret that there were not more types of loading machines

on display. Dr. L. E. Young, vice-president in charge of operations, Pittsburgh Coal Co., Pittsburgh, Pa.; A. W. Dickinson, general superintendent, Union Pacific Coal Co., Rock Springs, Wyo., and Dr. A. C. Callen, professor of mining, University of Illinois, Urbana, Ill., acted as chairmen of the sessions on mechanical loading.

Doubting Thomases who have held that physical conditions must be "ideal" before a successful application of loading machines can be made found little comfort in the recital of the experiences of the men who are actually using this equipment. As one of these declared, it was possible to take an average mine and by instilling the right spirit in the workers build up daily output to a point where profits were attractive. If practical improvement were dependent upon "ideal" conditions, it was pointed out, there would be no progress.

Management's part in making the use of loading machines successful was stressed. Unless underground transportation was running smoothly and operations were carefully planned, the loading machine easily might become a liability instead of

an asset because idle time would run up the interest charges per ton on the investment in this equipment. Roof control was another phase of loading machine operation that developed close discussion.

Although the session on "Safety in Coal Production" presided over by W. L. Robison, vice-president in charge of operations, Youghiogeny & Ohio Coal Co., Cleveland, Ohio, did not draw as large an attendance as some of the earlier meetings, what was lost in numbers was more than made up in interest. According to one speaker, he was almost bowled over in the middle of the session by an operator who was rushing out of the hall to telegraph his office to tighten up on safety work.

The closing session Friday afternoon was devoted to a discussion on "Cutting and Blasting." Erskine Ramsay, chairman of the board, Alabama Byproducts Corporation, Birmingham, Ala., was the chairman of this meeting, which went into the questions of conditions under which top and bottom cutters should be used, how blasting costs can be reduced through supervision and how blasting efficiency increases production.

No Final Action Taken by American Mining Congress on Safety Code Project

Should Standards Be Made by Congress, National Coal Association or National Safety Council?—Meeting Adjourns with Motion Expressing Interest in Progress of Safety Practice Studies

COMMENDING the work of individual mine operators in promoting safety and of various agencies in promulgating codes of safe practices and declaring that a study of safety information and methods should be made by the American Mining Congress, the meeting called at Cincinnati, Saturday, May 21, after the conclusion of the Convention of Practical Coal Operating Men, adjourned without formulating any definite program.

A special committee was appointed in December of last year by the Mining Standardization Correlating Committee in session at Washington, D. C., for the purpose of considering ways and means of advancing "the coal-mining safety codes which have been before the correlating committee for several years." The special committee was instructed to "consider the initiation of other projects in the field with the idea of completing, within a reasonable time, safety codes covering all the important subjects in coal-mining operation."

HOSLER IS CHAIRMAN

The committee consisted of Rush N. Hosler, chairman, J. F. Callbreath, Lucian Chaney and Daniel Harrington. It met in Washington, April 2, and was unanimously of the opinion that some organization should undertake such codification of safe practices. "Mr. Callbreath, at the invitation of the committee, agreed to include the project as a part of the fourth annual convention of practical operating men to be held under the auspices of the American Mining Congress at Cincinnati," Friday, May 20, the conference to discuss the topic "Shall we develop basic safety codes for coal mining?" The meeting was actually held on the following day, the day set being devoted to the reading of papers on safety subjects and to discussion thereupon.

At Saturday's meeting H. M. Payne occupied the chair. At the meeting, were present according to the registration cards, two representatives of the Bureau of Mines, one of the U. S. Geological Survey, two

professors of mining, four chief mine inspectors, nine representatives of mine operating and engineering associations, thirteen representatives of manufacturers, twenty-one representatives of coal-mining concerns, seven representatives of coal-mining insurance companies and two editors making sixty-one in all.

SAFETY BLOCK ADVOCATED

Dr. Payne said that many practices were susceptible to uniform provision regardless of local conditions. Everyone, for instance, would agree that a safety block should be placed at the head of a plane. Uniform traffic laws relating to the colors to be used to indicate the rights of way had been adopted for the regulation of vehicles. These, said he, were random illustrations of the basic principles on which safety codes might be formulated. Insurance was based on credit. The industry's credit had been so jeopardized by frequent accidents that the leading underwriting organizations had refused to continue to insure the payment of mine workers' compensation.

Dr. E. A. Holbrook said that laws were minimum requirements for safety. Something better than that was required to show what may be

done to attain freedom from accident. He was opposed to the inspection of mines by the U. S. Government, because the states were fully capable of providing an adequate and capable inspectional force. He said that the wide differences in the mining laws of various states—as evidenced in John A. Garcia's paper on the ventilation requirements of state laws delivered before the American Institute of Mining and Metallurgical Engineers—were without reason. There was a lack of standards for guides in the making of legislation. The Pennsylvania laws had been taken as an imperfect guide, and these statutes in turn had been based on regulations from British sources. The laws formed a sort of code, but complete codes were needed.

Safety rules had already been prepared namely the "Rules for Installation and Operation of Underground Electrical Equipment" prepared by the U. S. Bureau of Mines and the "Standard Practices for Rock Dusting." Other codes on which work has been done were "Handling and Using Explosives" and "Safety in Mine Transportation." The time had come to prepare definite safety rules in other phases of mine operation, such as mine illumination, ventilation, methods of safety inspection, hoisting, work at the face and methods of testing and taking down roof. There were 41 safety codes already promulgated outside of coal mining, and the coal industry must not lag behind. It was too late for anyone to protest against marriage after the children had been born. Safety codes had been made already. It was too late to discuss whether they should have been formulated.

J. F. Callbreath, mentioning the advocacy of the creation of the U. S. Bureau of Mines by himself and the American Mining Congress, declared that the bureau had managed in the first ten years of its existence to reduce the hazards materially. Since then no progress had been made. It was time to reconsecrate the industry to the work of safety. The



"Dan" Harrington

Joseph A. Holmes Safety Association had been formed, of which the president was the director of the U. S. Bureau of Mines and the first vice-president the secretary of the American Mining Congress. It was doing a good work on the interest of \$10,000 and with the help of the U. S. Bureau of Mines, but it needed greater encouragement.

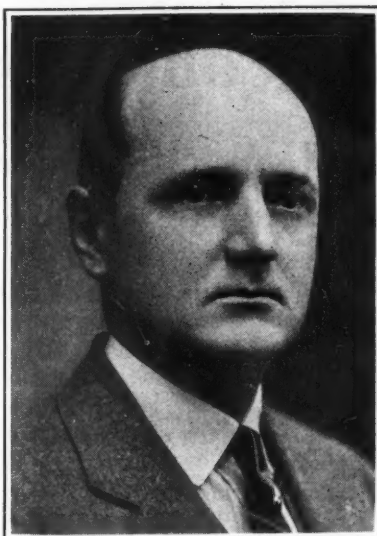
SAFETY COUNCIL WORK

W. D. Keefer was called on by N. S. Greensfelder, representing the manufacturers of explosives, to describe the work of the National Safety Council. Mr. Keefer said that 4,300 concerns were affiliated with the council on a non-profit basis. It had the largest library on safety in the world. Fifteen hundred to two thousand inquiries were received yearly of which 99 per cent were answered from the experience of members which, when necessary, was obtained by mail. Its purpose was to advance safety not so much by legislation as by voluntary restrictions. It had its representatives on the American Engineering Standards Committee.

Theodore Marvin declared that mining associations already were preparing safety codes. The Mesabi range had a committee holding quarterly meetings under the auspices of the Mining Section of the National Safety Council. The Tri-State Zinc and Lead Ore Producers Association under R. V. Ageton, a Mining Section member, has prepared a number of safety rules. Alabama coal operators were proceeding to do the same under a National Safety Council official. He favored the submission of all codes to the American Engineering Standards Committee.

SAFETY LEGISLATION OPPOSED

Frank Dunbar alleged that safety could not be legislated any more satisfactorily than prohibition. Mr. Harrington said that the U. S. Bureau of Mines had received requests from seven different states asking for suggestions as to legislative codes. The Bureau had nothing to offer and could not point to any standards that would furnish a basis for legal enactment. He believed that general rules could be written that would be applicable to all mines. He presented a statement by A. W. Dickinson in which several enactments were favored including the general adoption of closed lights, and permissible explosives used in permissible quantities.



W. H. Lesser

Erza Van Horn offered a motion that a committee of five be appointed to report on the proposal to the annual meeting at Washington, D. C. E. J. Newbaker, general manager, Berwind-White Coal Mining Co., wanted to know as to the complexion of the committee. Was it to consist solely of coal operators? Was it to include metal-mine men? Was the call a broad one for all mining industries or was it merely for those interested in coal mining? No one seemed to know. Dr. Payne and Mr. Callbreath believed it was general, Dean Holbrook thought it applied to coal mining only and incidentally the wording of the call supports that conclusion.

RIGHT TO DECIDE CONTESTED

W. H. Lesser wanted to know the character of the representation. He wished to be informed whether those present represented anyone but themselves. Mr. Newbaker asked if the call had included only members of the American Mining Congress. If it had, and this was a Mining Congress meeting, they might vote as members, but if not they should, at least, be duly accredited to the meeting. If a series of codes was to be written for all kinds of mines he wanted to know whether the conferees were representative of the whole mining industry. Coming after a coal-mining conference the meeting might well be expected to consist solely of coal men. Furthermore was a voluntary code suggested or one to be enforced by legislation? He would like a meeting of coal operators to decide what to do.

J. F. Callbreath said that if only bituminous coal-mining safety standards were proposed, then the Na-

tional Coal Association should occupy the field. He would be opposed to any action that would attempt to appear either to dictate to, or head off, the coal operators' own association. What was proposed was not legislation but inquiry and standards simply. D. C. Kennedy, secretary of the Kanawha Coal Operators' Association, proposed an amendment to the effect that the matter be referred to the National Coal Association. C. J. Neecamp, secretary of the Northeast Kentucky Coal Association, said that the National Coal Association has had a committee in operation for six months investigating safety. The American Mining Congress should not duplicate this effort.

NO OFFICIAL STATUS

Herbert Wilson Smith, Union Carbide Co., stated that the meeting had no official status. It would be undesirable that a resolution be passed instructing the National Coal Association. The meeting being an informal conference could take no action. Mr. Neecamp said no proposal should be made until the National Coal Association committee had reported. He proposed that the meeting adjourn to convene after the report of that body. All these motions were put, beginning with the last. All failed of adoption. To adjourn without some action showing an interest in the cause of safety was thought undesirable.

Mr. Newbaker then proposed that a resolution be drawn by a committee appointed by the Chair. Dr. Payne appointed H. W. Smith, N. S. Greensfelder and Lee Long. The resolution read: "It is agreed that the consensus of opinion of this informal meeting is as follows: The American Mining Congress, because of its years' of interest in accident prevention, on Saturday, May 21, served as a medium of informal discussion of methods for approaching further study of accident prevention; that this meeting commends the work of individual mine operators in taking the initiative in safety work; that the collection of information by various agencies concerning safety methods found successful in the experience of mine operators be commended; that a comparative study of information on safety methods so assembled and which can be further made available be continued by the American Mining Congress." This resolution or expression of agreement was approved by the meeting, and the session was adjourned.

American Mining Congress

Sees in Well-Cleaned Coal, Mechanically Loaded, a Solution of Industry's Ills

THE COAL INDUSTRY showed a keen sense of the need for hastening the completion of modernization plans when the Fourth Annual Convention of Practical Operating Men, held under the auspices of the American Mining Congress, met in Cincinnati May 16-20.

That it was alert to the need for new methods was proved by the early, business-like attendance of operating and executive personnel from all parts of the nation.

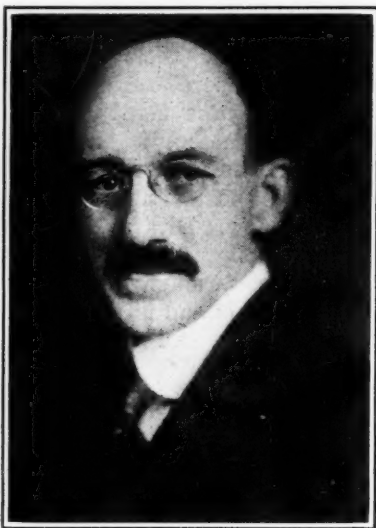
Though registration at former conventions of this organization was large, the attendance advanced to and receded from a peak reached near the middle of the week and the numbers of men at the various meetings showed somewhat the same general trend. Not so this year, for though the formal opening of the National Exposition of Coal Mine Equipment, held in conjunction with the convention, was scheduled for Monday evening, many operating men were to be seen earlier in the day milling around the exposition booths.

With a large crowd already in attendance, the first technical session of the convention, devoted to coal preparation and held Tuesday morning, got away to a flying start under the chairmanship of Howard N. Eavenson, consulting engineer, of Pittsburgh, Pa.

Mr. Eavenson briefly outlined the general trend of the industry toward mechanization and the broader phases of modernization. The technique of industry, that of coal included, changes nowadays as rapidly as styles in clothes and unless operators are alert to this fact, he said, they would find their methods of operation far outmoded. Modernization programs are not complete without provisions for thorough preparation of coal. Referring to the thoughts of an editorial entitled "Coal, of Late Years, Has Been Too Costly," in the May 12 issue of *Coal Age*, he asserted that the coal industry's major obligation was to itself in providing for greater safety, for higher salaries to its management and engineering per-

sonnel, for research and for a fair return to stockholders; that the immediate aim should not be, as the editorial declared, toward a lower price of coal to the consumer as a means of stimulating consumption.

In a paper on "Necessity for and Recent Developments in Coal Preparation," E. A. Holbrook, dean of the school of mines of State College, Pennsylvania, stated that the industry will have to overcome the disposition of the consumer not to pay a premium for bituminous coal properly prepared. The producers created this attitude of the buyer



E. A. Holbrook

by carrying out the theory that they could not afford to reject much of the material produced by the miner while their margin of profit was ever narrowing, due to increasing competition. In an aside Mr. Holbrook said that such great strides have been made in preparation methods that plants erected in the anthracite field five years ago stand in a fair way of soon becoming obsolete. Many operators, he said, don't seem to realize that a preparation process suited to one class of coal may not meet the requirements of another. The washability of coal is dependent upon a number of well-defined physical and chemical characteristics that enable its division into classes. A coal should be classi-



H. N. Eavenson

Chairman, Tuesday Morning Session

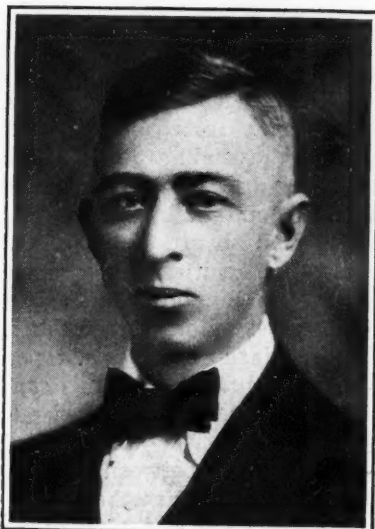
fied before the search for a process of cleaning it is begun. Greatest progress will be made when the industry puts preparation problems in the hands of specialists instead of chemists or mining men.

ASHMEAD DISCUSSES PAPER

F. R. Wadleigh, consulting engineer of New York City, was scheduled to read a paper but was absent owing to a death in his family. His paper was not presented. In discussing Mr. Holbrook's paper, D. C. Ashmead, consulting engineer, Wilkes Barre, Pa., said that lessors are from year to year becoming less satisfied in the recovery of coal per foot-acre and that this will gradually compel the acceptance of mechanical preparation.

In a paper entitled "Economical Methods of Eliminating Impurities in the Preparation of Anthracite Coal," F. G. Wilcox, president of the West End Coal Co., Scranton, Pa., outlined the logical approach in the consideration of mechanical cleaning and its application to anthracite coals. Industrial and domestic users are compelling more thorough preparation of this fuel.

Humphrey D. Smith, assistant to the president, Majestic Collieries Co., Bluefield, W. Va., in a paper on "Economic Methods of Eliminating Impurities in the Preparation of Bituminous Coals," stated that the cost of hand-picking coal high in ash is more than that of mechanical cleaning of egg size of the same coal. He stated that the domestic consumer is likely to choose coal of 7 per cent ash content in preference to that containing only 5 per cent of



F. G. Wilcox

impurities if the latter sold at a premium of, say, 50c. This is not true, however, in the case of coal intended for conversion purposes, as for by-product coking, gas producers, etc. The instability of the market places the operator in a position where he does not know how far he can afford to go in ash reduction. He maintains that the rejection loss should not be entered against cleaning, but that the actual cost of cleaning should be allocated to the coal shipped.

Col. Roberts, president of the Roberts & Schaefer Co., said that a sufficiently high reduction of ash in nut coal cannot be obtained by hand picking to pay for the labor involved. He attacked as illogical the statement made in Mr. Smith's paper to the effect that operators do not find it advisable from a practical standpoint to swing to mechanical cleaning until after demand for their product falls off because of its high ash content and when, consequently, broken-time operation of their mines results.

Erskine Ramsay, chairman of the board, Alabama By-Products Corporation, Birmingham, said that miners are disposed to become careless after a cleaning plant is provided, loading more dirt with the coal than before. At a certain mine where washing was practiced the rejected material amounted to 24 tons from a unit feed of 100 tons. Then a system of sampling the output of the individual miner was inaugurated. At the end of two weeks the rejected material from a unit feed of 100 tons fell to 18 tons. The saving thereby effected amounted to about \$5,000 per month. By the

same method of sampling the Woodward Iron Co. diminished the amount of rejected material in 100 tons of mine output by 50 per cent—from 20 tons to 10 tons—and thereby saved \$120,000 in a year. Miners who load dirty coal are penalized and those who produce a clean product are given a bonus. The penalties pay for the bonuses.

The scheme of sampling in these two instances involves a chute which takes 100 lb. of coal from each mine car as it is turned over by a rotary dump. This chute can be moved so as to vary the position, with respect to the car, from which the sample is taken. Each sample is passed over a shaker screen which rejects the minus $\frac{1}{2}$ -in. product, the oversize being hand picked. The cost of this sampling is roughly 2c. per ton. Mr. Ramsay thinks the amount of rejected material from the entire sample should be determined, in



J. W. Wetter

which case the miner would not deliberately load fine coal of high ash content.

J. William Wetter, general manager of bituminous mines, Madeira Hill & Co., Phillipsburg, Pa., delivered a paper on "Preparation of Bituminous Coal by the Sand Flotation Process," dealing with the operation of the Mt. Union plant which has already been described in this magazine. One consumer of the coal shipped from this plant made a test which revealed that the moisture increase due to wet washing amounted to about 0.5 per cent.

Some discussion revolved about a question as to the extent of moisture increase in coal and the manner in which this moisture is held. H. M. Chance, consulting engineer, Phila-



H. D. Smith

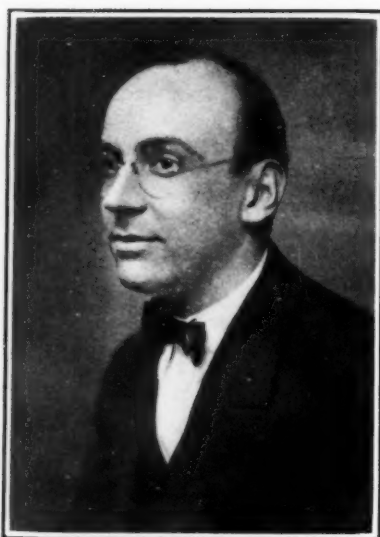
delphia, declared that the coals east of Indiana absorb little moisture. E. A. Holbrook added that absorption is not an important factor in the question as most coals take up little water. Most of this water is deposited on the surface of the coal. Mr. Emery of Madeira Hill & Co., stated that coal shipped from the Mt. Union plant yields a high realization and that the increase in moisture is not given consideration.

J. B. Morrow, general outside superintendent, Stag Canyon branch of the Phelps Dodge Corporation, Dawson, N. M., presented a paper on "Cleaning Coal at a Phelps Dodge Corporation Plant," dealing with experimentation over a period of many years which led to a jig-and-table cleaning process. The final plant was erected in 1916 and continued in operation until 1926 when the copper smelters abandoned the use of coke obtained in this manner. The raw coal was crushed to $\frac{1}{2}$ -in. as a preliminary to screening. The operating characteristics of this plant accomplished the purpose for which it was intended.

Tuesday Afternoon

DR. J. J. RUTLEDGE, chief mining engineer, Maryland State Bureau of Mines, Baltimore, Maryland, had charge of the session on coal preparation Tuesday afternoon.

William H. Lesser, mechanical superintendent, Madeira, Hill & Co., Frackville, Pa., outlined in his paper the principle and application of the Chance flotation practices in the anthracite field. The sand flotation process of cleaning anthracite, he said, was a method which enabled the



Louis M. Huber

separation of coal from refuse regardless of fracture and size of the feed. The operating results obtained at the Colonial breaker recently described in *Coal Age* show that this plant, with its four cones is capable of cleaning 3,500 tons in 8 hr. Raw coal is discharged into a mixture of water and sand having a density of 1.75.

Other operating data presented by Mr. Lesser showed that initial investment and operating costs have been lowered by the sand flotation process as compared with the more popular old type jigs. The Colonial plant, he said, was built for approximately 70 per cent of the cost of a jig-operated breaker of similar capacity. Furthermore, the operating costs are approximately 15 cents per ton less than those obtained in jig-equipped breakers. The operation of the plant requires about 12.5 lb. of sand per ton which represents a cost of 1.25c. per ton.

Coal in the territory in which this breaker is located has a specific gravity varying between 1.47 and 1.7, the refuse varies between 1.9 and 2.6. The operating results show a $3\frac{1}{2}$ per cent increase in prepared sizes over that obtained in the old breakers. The car yield is 1/10 of a ton less than formerly because better coal is shipped to market.

Charles Dorrance, mining engineer, Scranton, Pa., stated in his paper that 24 Chance coal cleaning plants have been installed in the anthracite field since 1921. The capital investment required for this type of plant is 60 per cent that of a jig-operated breaker and the labor approximately 50 per cent. Loading booms can be used more readily thus reducing breakage.

Greater preparation yield is possible with sand flotation than with jigs and breakage is greatly reduced. The lesser proportion of slate in the shipped coal increases the possible profit and aids in the sale. As much as 25 cents per ton more can be obtained for clean coal. Present market demands for clean coal puts jig breakers in a poor position to get rid of their product.

Better and more uniform sizing is obtained with the sand flotation process. Some of these benefits are, however, attributable to improved designs used in building breakers and other pertinent preparation equipment. The greatest difficulty in preparing coal today rests with control of slush and slate. This is particularly true with jigs because of the necessity for regulating the feed and

ing process selected will not function properly.

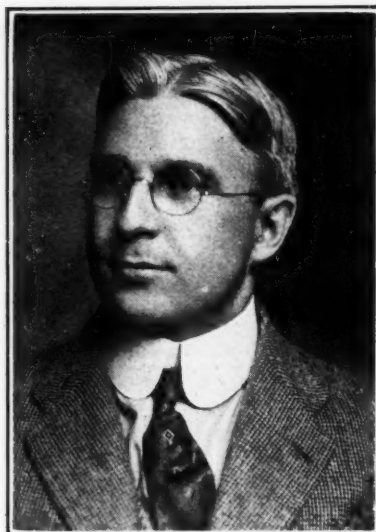
For wet processes of cleaning small size fuels various methods have been quite well established. Among these are the shaking table, launder system, Hydrotator, Trent process and froth flotation. Dry cleaning is accomplished on air tables. In wet processes difficulties arise due to moisture which may blind screens. Dry processes entail dust problems.

Froth flotation holds great possibilities. Coal tar or pine oils can be used. The process is not dependent upon the relative difference of specific gravity between coal and refuse but rather upon the ability of the froth-forming materials to form bubbles and exert a strong affinity for the coal. The rising bubbles and particles of coal come to the surface of the liquid and float off whereas the heavier materials having a low affinity for the oil sink.

Experiments thus far carried out show that about two pounds of froth-forming oil is required per ton of fuel treated. Oil processes, contrary to usual belief, give good separation between sulphur and coal particles.

Paul Sterling, mechanical engineer of the Lehigh Valley Coal Co., Wilkes-Barre, Pa., read an abstract of the paper prepared by Shelby D. Dimmick. This paper revealed the fact that although the Rheolaveur method of coal cleaning has been used only two years in this country six plants utilizing this equipment are now in operation with an annual output of 2,250,000 tons.

The Loomis plant of the Glen Alden Coal Co. of Scranton, one of the operations under the supervision of Mr. Dimmick, and mentioned in



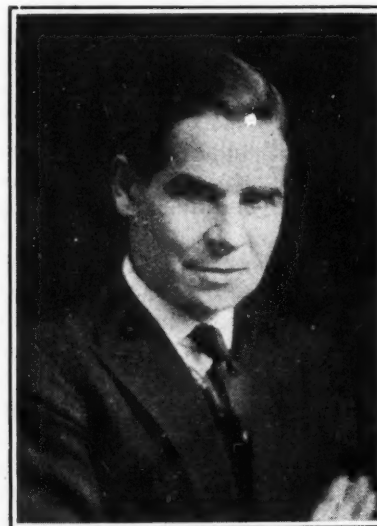
S. D. Dimmick

depth of the bed of coal and slate in the machine.

Louis M. Huber, assistant professor of mining, Carnegie Institute of Technology, Pittsburgh, Pa., read a paper on cleaning small-size anthracite and bituminous coals. Inasmuch as most development along this line has been with treatment of bituminous coals he confined his remarks to this phase of the subject.

Small-size fuel generally refers to coals of $\frac{1}{4}$ in. or smaller. Analyses of these coals show that in most instances they consist of high grade materials and therefore justify any reasonable effort to prepare them for market. They find a ready sale whenever small sizes are required for coking or pulverized fuel plants.

The difficulty of obtaining a good representative sample of such fuel is great and unless it is done carefully and is frequently checked the clean-



William H. Morgan

the paper, was described in the Dec. 2, 1926, issue of *Coal Age*.

Mr. Sterling, in speaking of the success of the Rheolaveur process at the Hazleton Shaft Mine of the Lehigh Valley Coal Co. said preparations are now well under way to change over the whole plant to the new process. At present this plant has two 32-in. washing launders with three boxes on each and a 20-in. rewash launder for washing coal of sizes between egg and buckwheat.

Howard W. Morgan, director of research, Pittsburgh Coal Co., Pittsburgh, Pa., described the air cleaning plant of his company at the Montour No. 10 Mine. This plant is divided into two parts so that either section can be operated independently of the other. Coal is first screened and conveyed to the raw coal bin from which it is taken to the cleaning plant. Arms horizontal vibrating screens prepare the coal for treatment on the tables. These tables operate by means of an upward flow of air and a jiggling motion of the bed.

Depending upon the size of the coal, the grades and the thickness of the bed on the table, air pressure between 3 and 1½ in. is used. A separate blower is used on each table so that accurate control of the cleaning is readily possible. Middlings are re-treated and the prepared coal is kept separated in its travel to the various loading tracks.

Better preparation results are further expected, due to the installation of the Bronson deck on the last three or four tables. Already the application of the deck on the table treating ½ x ¾-in. material has shown marked improvement.

The average ash analyses of the various coals is approximately as follows: Nut-slack, 6.6 per cent; slack 7.9; stove 6.9; stoker 7.2; powdered fuel 8.2 per cent. With 7 per cent ash any of the above grades have a heat value of 14,000 B.t.u. per pound.

Analyses are made at both the mine and central laboratories of the company at Pittsburgh so that an accurate check is maintained. The raw coal entering this plant contains between 9 and 9.5 per cent ash. Refuse analyzes approximately 4.5 per cent ash. The refuse removed from the raw coal represents about 4 per cent of the total fuel dumped and treated in the plant. Both the original Marcus tipple and new dry-cleaning plant were designed and built by the Roberts & Schaefer Co.

Wednesday Morning

ON WEDNESDAY MORNING coal preparation was again the general subject. J. D. Zook, vice-president and general manager, O'Gara Coal Co., Chicago, presided over the session. Three of the papers described equipment or results at dry cleaning plants, two were confined to wet washing methods and the other dealt with special problems encountered in treating off-grade coals.

Milo W. Summers, engineer, Turkey Gap Coal & Coke Co., Dott, W.



Charles Enzian

Va., described the American dry cleaning plant at the Modoc mine, in the Pocahontas field. This plant has been in operation only about two months, but according to Mr. Summers, it has proven an entire success.

William J. O'Toole, general manager of the American Coal Cleaning Corp., in discussion called attention to the many reasons why he believes dry cleaning is preferable for general and specific conditions. He said that purchasing agents in the northern part of the country refuse to buy washed coals for by-product work because of their high moisture content.

Erskine Ramsay, of Birmingham, told of effecting an increase of approximately 50 per cent in output per oven at a coking plant by installation of a coal washer.

Dry cleaning of coal at the Berwind-White operations was the subject of a paper by Charles Enzian, mining engineer of the Berwind-White Coal Mining Co., Windber, Pa. He described the careful preliminary investigation, actual layout, and results, at the new Eureka No. 37

plant, which contains the Arms air concentrators, and which was built to handle 2,500 tons per day.

The sizes from 3½ in. down to 0.11 in. representing 83 to 93 per cent of the whole product are air cleaned. There are eight tables in the plant. Mr. Enzian stated that the results have been highly gratifying and that they have justified the large capital expenditure.

Dust collecting has been the biggest problem at the plant. The three centrifugal collectors which operate at 75 to 80 per cent efficiency, handled 180,000 cu.ft. of air per minute. The connected horsepower to operate the separators is 820, or about 83 per cent of that required for the entire cleaning plant. Experience has shown the need for a dust collecting system which will take out about 98 per cent of the dust.

INITIAL COST OF PLANT

The initial cost of the plant was \$940 per ton-hour capacity. The air cleaning had added approximately 7 per cent to the former mine cost. This extra expense is about half capital charge and half operating cost. Mr. Enzian cautioned that the installation of the cleaning plant should not be followed by a let up in reasonable precautions to prevent the loading of dirty coal in the mine.

F. E. Mueller, vice-president of the Roberts & Schaefer Co., of Chicago, in discussing Mr. Enzian's paper, stated that the sudden demand for air cleaning plants and the rapid increase in size has not given the manufacturers time to keep up in the development of the efficient and economical dust collectors needed for the large capacities such as the 400 ton per hour plant of the Berwind-White company.

He said that the present cost of air cleaning plants runs from \$500 to \$1,000 per ton-hour capacity, and that a thorough investigation, taking into consideration all factors and conditions, should be made when the installation of a cleaning plant is being considered.

William J. O'Toole called attention to a bag filter which handles 75,000 cu.ft. of air per minute and recovers 98 per cent of the dust therein, and yet requires only 43 hp. for driving the fans.

In the absence of William Beury, general superintendent, Algoma Coal & Coke Co., Algoma, W. Va., H. D. Smith read his paper, entitled "Results Obtained in Cleaning Coal at the Algoma Coal & Coke Co." This

plant handles Pocahontas No. 3 coal, of size under 2½ in. down to ¼ in., on Arms air concentrators.

A test showed the average ash reduction in the ½ x ¾ in. size to be from 8.93, down to 5.17 per cent, in the ¾ x 1 in. size, from 10.4 down to 7.3 per cent, and an average for the 2½ to ¼-in. size of from 9.47 down to 6.7.

The first paper dealing with wet cleaning was by Robert E. Hobart, mechanical superintendent of the Lehigh Coal & Navigation Co., Lansford, Pa. The paper, "Preparing Coal by the Table Washing Method," was confined to experience and tests in washing the small sizes of anthracite.

Mr. Hobart stressed the importance of three factors: foundation, regular rate of feed, and adequate water supply under constant head. In wood or steel tripplies, the concrete piers supporting the table should be integral with a 5-in. reinforced-concrete floor.

Cost figures based on operating experience showed that in cleaning fine coal, the tables proved far superior to jigs. With the former, the total cost was 6.53c. per ton, and with the jigs, 2.78c. per ton.

The topic, "Preparation and Marketing Crop Line and Off-Grade Coals," was handled by W. C. Shank, president of the Carbon Coal Co., Pittsburg, Kansas.

He stated that crop line coal usually has the following characteristics: It is softer than the average for the seam, it contains a high percentage of moisture, has a relatively low ash content, and is generally non-coking. Zinc smelters and cement plants are the principal markets for this type of coal. It is important that it be loaded as clean and dry as possible.

The off-grades consist of discolored coal and coal containing an excessive amount of pyrite. The small sizes of discolored coal are sold to power plants, and the coarser grades to industrial plants or for locomotive fuel. Certain grades of the pyritic coal are passed through a single roll crusher and rescreened to eliminate much of the sulphur. When the impurity is of a softer nature, the coal is crushed to stoker size, and sold to power plants on a B.t.u. basis.

The last topic of the morning session, "Cleaning Coal by the Wet Jig Process," was presented by E. E. Finn, director of research for the Lehigh Coal & Navigation Co., Lansford, Pa., and was confined to the cleaning of anthracite.

Height of slate bed and uniformity

of feed were emphasized as highly important factors in the operation of jigs which are commonly neglected. Flat slate can be removed with no difficulty if the slate bed is of sufficient and proper height. Rarely are the storage pockets above the bins built with sufficient capacity to insure best results in uniform feed.

Mr. Finn mentioned that in comparing the capacities and operating costs of jigs, the figures should include computations on a tonnage feed basis for the reason that the impurities in raw feed may vary from 10 up to 45 per cent. The latter condition may obtain where the veins are on such a pitch that the coal and slate must be loaded together.

He submitted actual costs (covering 1926) of operating jigs which were in their fourth year after installation. The figures include depreciation and interest on the jigs. With the overflow type, the total cost per ton of feed was 4.57c., and 6.72c. per ton of commercial coal output. With the pan type jigs these costs were 3.6c. and 5.52 c., respectively.

Wednesday Afternoon

THAT it is possible to hold the face of a longwall working for ten or more days and to resume its operation without any loss of the coal face, the timber, hydraulic jacks or equipment, that the longwall face can be kept 18 ft. from the break line, that the roof does not come straight down, that compressible cribs are not needed and that hydraulic jacks will resist the pressure to which they are subjected without going through roof or floor were statements made by R. Y. Williams, of Weston Dodson & Co., Pottsville, Pa., at the Wednesday

afternoon meeting. He said that the matter of roof action needed purging of a lot of wild theory which experiment showed had no basis in fact. For two and one-half years he had been working longwall faces and breaking the roof 18 ft. from the face. If the whole weight of the overburden was figured as resting on the hydraulic jacks by which the roof was supported, each one must be holding up 10,000 tons which was manifestly absurd. The pressure must be less than that. The coal adjacent must be providing no small part of the support. For a height of 45 ft. at least the break was staggered. Above that he did not know how it went. The jacks, he felt, surely supported only the lower section of the roof.

YOUNG LEADS OFF

Wednesday's afternoon program began with an address by the chairman, L. E. Young, vice-president, Pittsburgh Coal Co., Pittsburgh, Pa., who reviewed the progress of coal loading by machinery. In 1925, mechanically-loaded coal totaled according to the U. S. Bureau of Mines 64 million tons. The Bureau had no statistics for 1926, but the tonnage was probably 9 million. This, he was convinced, was a conservative figure. The letters he had received from manufacturers led him to that conclusion. He was of the opinion that the capacity of the machines installed, provided they were all working and not hampered by strikes, was a million tons per month.

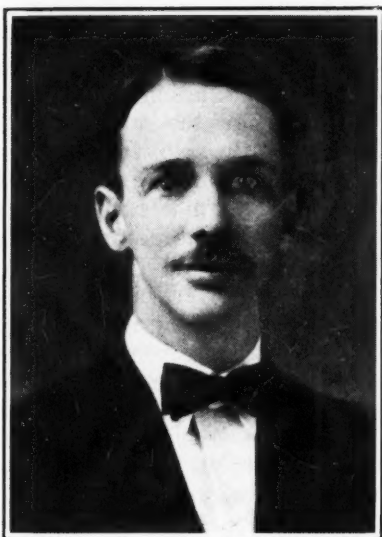
The first address presented was the interesting report of Glenn B. Southward, who, with the title of mechanization engineer of the American Mining Congress, has been making a review of the progress of the art of coal loading by means of machines. His inspections have covered 35 bituminous mines, all east of the Mississippi; probably all the most important have been covered.

The states visited have been Pennsylvania, Ohio, Indiana, Illinois, Kentucky, West Virginia, Virginia and Alabama. Six of these operations visited were frankly experimental and three were idle because of other reasons than those connected with mechanical loading, leaving 27 which were operating in a manner pleasing to their managements.

Out of 25 mechanical operations 56 per cent were room-and-pillar workings and 44 per cent were longwall or long-face modifications of room-



Dr. L. E. Young



Glenn B. Southward

and-pillar systems. In the 14 room-and-pillar workings 87 per cent were operated by mechanical loaders and 13 per cent by conveyors. Modified or long-face systems numbered eleven and of these 18 per cent only were operated by mechanical loaders and 82 per cent by scrapers or conveyors showing, said Mr. Southward, that at present mechanical loaders dominated in room-and-pillar workings and scrapers and conveyors in the modified or long wall systems. Long-face mining had not in all cases been satisfactorily solved owing to unfavorable roof action.

Some people believe that when operators say that they are successfully operating loading devices they mean that they can do so occasionally or for a time. Others believe they are merely deceiving themselves, having overlooked several incidental costs. With this Mr. Southward would not agree. If there were any question, such operators would not be buying more equipment, as many of them are doing.

H. F. McCullough was ill and not able to be present but T. W. Gray, of the Pittsburgh Coal Co., read the paper in his stead. He discussed the preparatory face work prior to machine loading, such as shearing and drilling. It seemed to him that the refuse should be mechanically handled, not only cut out by machine but also stowed in the gob or loaded into cars.

The turret machine, he said, was now being modified so that instead of discharging the cuttings on the floor to be shoveled into mine cars or thrown into the gob, it receives them as they leave the cut and puts them either into the gob or drops them

into mine cars thus eliminating the man-handling of these heavy materials. Why not do the same, said he, with the draw slate over the coal?

He would have power-propelled trucks carrying drills that would drill shotholes in the coal in any desired place and at any specified angle. The work would be made not only more rapid but more truly in accord with standards.

He did not speak very favorably of long-face methods. They could easily result in high costs, by reason of the difficulties in roof control that they might introduce. New equipment introduced into mines laid out according to methods of long standing might give the desired improvement.

COMMENDS SHEARING

To Robert L. Smith, president, Princeton Mining Co., Terre Haute, Ind., who spoke on "Developments in Cutting, Shearing and Snubbing with Mechanical Loading," shearing seemed helpful because it loosened the coal and gave a more blocky and firmer product with a smaller percentage of slack. Also it cut down the powder bill one-half and reduced the damage done to the roof coal if any be left or to the slate provided that was the measure by which the roadway was to be supported. It also aided in roof control.

The kerf resulting from shearing, said the author of the paper, is 6 in. wide; this leaves space into which the coal, rent by the explosive, can expand, thus preventing the shattering of the coal by the tremendous violence of a confined shot, the gases from which latter cannot spread and ramify as desired through the broken coal mass.

Mr. Smith did not question the value of the shearing machine and was troubled with only one quality, its faculty for getting in the way.

About half the time during the shift the shearing machine at the Princeton mine is idle awaiting an opportunity to get into action. In part this could, Mr. Smith believed, be cured by putting the machine on caterpillars so that it could go through the crosscuts from room to room, thus not interfering with the trackage.

But when placed on a caterpillar the machine, if it has a 9-ft. cutter bar, is 21 ft. long over all. When the roof is weak and has to be timbered extensively this is an exceedingly undesirable factor. Then,

again, if the cuttings from the undercutting machine are on the floor, they are likely to get under the caterpillar, whereupon the cutter bar will pinch and the driving motor may be stalled.

It is Mr. Smith's practice to drive his entries 11 ft. wide and with such a width a single center shear is satisfactory. Where one shear is made in a room face 21 ft. wide the kerf should be set about 7 ft. from one rib. On the short side of the shear one shot is used and on the long side two shots. Where the room is 26 ft. wide three shots are used to bring down the wide side.

Mr. Smith said that shearing increased the output of the loading machine 10 per cent. The result could be attained without shearing, if extremely heavy shots were used,



William G. Fletcher

but that gave such a percentage of fines as to be undesirable. He favored the use of an undercutter that would make it possible to undercut, shear and drill the coal with one machine, thus reducing the division of labor and the complication of the cycle.

Departing from the order of the meeting it may be said that C. B. Officer remarked that by shearing and snubbing, the cost of repairs on the loading machine was reduced because less work had to be done to free the coal mass from the face. He recommended a 9-ft. undercut because thereby the loading machine would find more work to do in each place entered. He also called attention to the shearing machine as an additional piece of equipment likely to be in the way. He did not say so, but the inference was that "Two's company and three's a crowd." He

advocated a combination machine that would undercut, shear and drill, keeping the machines down to two, the combination mentioned and the loading machine.

S. W. Farnham declared that success was being attained where a big band destroyed the integrity of an unusually clean seam. By undercutting above the band with a snubber, that parting could be broken by drilling and shooting. The band could then be removed by the snubber and then the two benches recovered by shooting and loading.

L. E. Young remarked that in those states where the number of shots fired at any one time is limited, the use of the shearing machine enables the operator to get a larger tonnage than he could otherwise without violating the provisions of the law. I. N. Bayless, general superintendent, Union Colliery Co., Dowell, Ill., said he did not realize in his experience that the shearing machine interfered much with the operations of his cutters and loaders in his 10-room panels.

Mr. Smith's paper was followed by that of W. T. Fletcher, general superintendent, Inland Collieries Co., Indianola, Pa., whose work and that of Thomas G. Fear at Indianola, Drs. L. E. Young and J. J. Rutledge, in later remarks, praised most highly, not only because of the results but because of the difficulties to be overcome.

Mr. Fletcher put roof control as the most important factor. He said it was 80 per cent of the difficulty. L. F. Gerdetz, mining engineer of the Georges Creek region, who spoke later in discussion, declared that roof control was an unimportant feature, one which we would soon forget. We will soon acquire the knowledge necessary and not think much of it. Perhaps the statements are not greatly at variance. Roof control is an important step. When methods suited to any region have been tested out, modified and a standard adopted, it is to be hoped that everything will go along so that the many balancings and totterings of our first steps in longwall will all be forgotten.

Meantime here is W. G. Fletcher mining the Thick Vein Freeport seam in Allegheny County of Pennsylvania, which is 8 ft. thick, by long wall without packwalling with an extremely weak roof and an overburden running all the way from 200 to 600 ft. Above him is 8 to 12 in.



I. N. Bayless

of shale rock that resembles the drawslate in the Pittsburgh seam, 18 ft. of gray shale and 12 ft. of red shale and then interlaminae of many kinds extending to the surface. Not at all a kindly condition for longwall operation without pack walling and justifying his statement that while he is learning the style of the roof it is not easy for him to fight it.

The faces are short, only 130 ft. long, and face conveyors are used, discharging onto lateral or main conveyors to a loading station at the entry. Cribs are placed, using 6 x 6 x 30-in. timber, the latter dimension being later increased to 36 in. These are set 2 ft. apart and laid on slack, so that they are the more easily removed, for the purpose is to remove them all, thus reducing timber cost.

The roof cracked at the face, but that did not matter so long as it stood without splintering between the cribs, leaving them in shape for ultimate recovery. Cracks 6 in. long might appear at the face, but the rock thus fractured had support and gave no trouble when properly wedged. Sometimes it splintered, however and then forepoling and lagging were needed and rock might fall and have to be removed.

Apparently from Mr. Fletcher's remarks there were two faces each of 130 ft. length with a chain pillar between, 36 ft. wide, which latter was mined by hand. This it was decided to sacrifice, but eventually the face conveyor was extended across the entry and five cribs were set to protect that roadway, a small rib being left to prevent rock from sliding into the road.

All of which was desirable, because it gave the men two escape-ways where they had but one before; it aided the ventilation and it threw the pressure on the middle of the face, because the cribs had the same effect as the chain pillar had given. However, a return was made to the old method and the removal of the chain pillar by hand. Two or three cribs were, however, put in so that the exit of the men by two roadways was provided and ventilation was kept open. The whole operation was complicated by the lack of a surface break. None occurred till after April 1 of this year when the mine closed down because of the labor suspension.

Each face produced 180 to 210 tons per cut and gave an average of approximately 18 tons per man shift. About 65 per cent of the timber was recovered, but under the worst conditions only 10 per cent might be saved.

COSTS ENUMERATED

The cost of operation might be roughly divided as follows: Timber, 25 per cent; explosives, 8; labor, 54; power, 3; maintenance, 6, and repairs 4. There were no fatalities and little time was lost because of minor accidents, but this was due to diligence in supervision, correcting a condition admittedly hazardous.

Dr. J. J. Rutledge in later discussion declared that here was longwall driven with only one line of cribs, most of which were recovered. The break line was 20 ft. from the face. That shows what can be done. Some people deny that this is feasible. L. F. Gerdetz proceeded to justify Dr. Rutledge's statement that there were some who questioned the possibility of keeping the break line 20 ft. from the face. Dr. Gerdetz said that the initial fracture always occurred at the face and not along the line of cribs or props. Perhaps, he said, minute fractures may be found at the line of cribs, but the main line of fracture occurs at the coal. He stated, however, that he was talking of real longwall—1,000 or 2,000 or more feet long and not 100 or 200 ft. Perhaps with a short face such as the latter, it might be possible to carry an overhanging shelf 20 ft. wide, but that was not real longwall.

The paper of Thomas W. Dawson, chief engineer, H. C. Frick Coke Co., Scottdale, Pa., was read by C. H. Dodge. Mr. Dawson urged that in

mining a face the greater the rate of operation the less roof trouble. With faces of moderate length, 30 to 100 ft., the greatest success is attained and, he added, by varying the angle of the gob line to the face or butt line the intensity of the pressure on the coal face can be varied. He advocated stepping the faces along a gob line of approximately 45 deg., and reducing the distance between breakline supports and the corners of the stepped-face pillars on which the roof rests.

Mr. Dawson remarked that timbering and the use of jacks for the support of the roof were costly not only in material but also in time. In one instance where heavy jacks were used they were recovered by a small hoist and their removal and replacement consumed a full third of the whole time of the cycle of operations. This was on a 100-ft. face with a 6-ft. seam and 250 ft. of cover.

TROUBLE WITH BAND

Dr. E. E. Fyke, president, Marion County Coal Co., Centralia, Ill., detailed the difficulty he had experienced with the 2-in. to 6-in. blue band in his bed of coal which is 6 ft. 6 in. thick. When the coal is loaded indiscriminately by machine the product is expensive to clean. In the Centralia district this band is from 10 to 18 in. from the floor. The coal is first undercut across the entire 30-ft. face with a 7½ ft. cutter bar. Then five drill holes are made in the coal immediately above the blue band and each rib shot is charged with two sticks of permissible powder. The center holes have but one stick. At the end of the day shift this coal is shot down and at night, cleaned and loaded by hand, the impurities being stowed in the gob. The coal is now ready for drilling. Four holes are placed near the roof and the coal shot down. A car holding 4,500 lb. can be loaded by machine in 50 sec.

Thursday Morning

A NUMBER of contentions of marked significance were developed at the Thursday morning session on mechanical loading. That the industry is giving serious consideration to double shifting was repeatedly indicated in the papers and discussions. The value of a high rate of mining on the one hand and a large return on the investment in equipment on the other are the chief

factors which have influenced this trend of thought.

What should be the percentage of recovery constitutes another bone of contention. One man spoke of complete recovery and several others expressed satisfaction in a recovery of about 85 per cent, claiming that the coal abandoned, after all, is not entirely lost, as it helps to support the roof during mining and saves much in the cost of timbering. Throughout the session, one bit of evidence after another showing the phenom-



Edward Bottomley

enal betterment of safety by mechanical loading and conveyors was presented. The degree to which this is being accomplished is best indicated by the fact that few accidents are reported as resulting from the noise caused by loading machines which drowns signals of roof movement, that otherwise would be audible. Shooting of coal for mechanical loading is a difficult problem, in the solution of which slight progress has been made though much effort has been applied to it.

The chairman of this session was A. W. Dickinson, general superintendent of the Union Pacific Coal Co. The following is the gist of his introductory remarks: He expressed a rather positive belief that the coal industry would follow metal mining in establishing double shifting. Production by conveyors and loading machines is mounting rapidly. He indicated this rise by records of production in Wyoming for 1925 about 500,000 tons; for 1926 about 1,500,000 tons and for 1927 between 2,250,000 and 2,500,000 tons if the rate of production thus far maintained is continued during the rest of the

year. Operation of mechanical loaders in Wyoming proves that this method can be made successful under relatively poor roof conditions.

In a paper on the subject of "Conveyors as Applied to Longwall Mining," D. A. Thomas described the methods used at the Aldrich mine of the Montevallo Coal Mining Co., Birmingham, of which he is president.

A recent development at this mine is the application of a heading car-loader which elevates coal from a contributory shaking conveyor to the mine cars. This device avoids the necessity for taking 4 ft. of bottom on the roadways, a practice which caused bad roof conditions owing to disintegration of bottom rock. A conveyor unit consists of 325 ft. of pans, a 30-hp. drive, a heading car-loader and accessory equipment. The upkeep cost of five of these units, including drive ropes, has been amounting to 3c. per ton. Loss due to burying of equipment during the last three years totaled only \$3,500.

F. H. COLEMAN SPEAKS

F. H. Coleman, assistant engineer of Graff Bros., Blairsville, Pa., outlined the practices in mechanized mining of his company in a paper on "Conveyors Applied to Room and Pillar Mining." He believes that no company will achieve satisfactory results in mechanized mining without a great deal of experimentation. It has been the experience of his company that the greatest danger from falls of roof prevails in the driving of narrow places and not during the process of extracting pillars, as one would expect. Conveyors and other equipment, consequently, are kept as close as possible to the ribs of coal. The company has been quite successful in recovering long standing pillars by open-end methods using conveyors. In this work the coal is loaded onto portable conveyors and thence carried by a room conveyor to a main conveyor that is located on the entry. In 15 months of conveyor operation only one accident is reported. This occurred in connection with the operation of a cutting machine and was non-fatal.

The company has tried out several wage scales for conveyor mining. One was a tonnage rate based on a sliding scale which was low for the first few tons and which increased in proportion to the tonnage

loaded. This scale was not properly adjusted to enable the men to make a fair living and consequently was abandoned with the result that they became suspicious of this kind of mining. To overcome this feeling, the company instituted a day rate which was higher than that for any other job in the mine. To it was added a small bonus for output above a fixed tonnage. This scheme was found to be fundamentally wrong because no incentive was provided for producing a big tonnage. A compromise scale is now in effect, the men being paid a day rate smaller than that for other work in the mine, to which is added a substantial bonus per ton above an easily attained minimum. The bonus itself is on a sliding scale. The miners did not like this arrangement at first but are gradually accepting it without complaint. The experience of this company is that the rate of loading into a conveyor is only about 10 per cent higher than that of loading into a mine car. The advantage attached to the conveyor is that the miner is enabled to load during a greater proportion of the working time.

SCRAPER MINING

During the last three years the Pennsylvania Coal & Coke Corp. mined over half a million tons by scraper methods in three of its mines, in coal varying in thickness from 32 to 44 in. This coal was mined in a "V" layout in which a panel is worked one place at a time leaving a rib between it and the adjacent worked-out area. S. W. Blakslee, division superintendent of this company, describing the work in a paper on "Scraper Loaders Applied to Modified Longwall Faces," says that the rib of coal left between the "V" places facilitated the control of roof. An attempt was made to work three places side by side simultaneously, but the scheme was finally abandoned for the reason that the roof could not then be kept under control.

TIMBER COST 4C. EXTRA

Summing up the results obtained by his company in scraper mining, Mr. Blakslee states that the cost of timbering has been only 4c. per ton greater than that for room-and-pillar work. No fatal accidents have occurred in the production of half a million tons by scraper mining, the extent of injury being a few broken bones suffered by two men. The

compensation cost at the mines where scraper mining is practiced is less than half of the average compensation cost incurred at those mines of the company which are being worked by the room-and-pillar method. Labor turnover has been decreased greatly by the new methods of operation.

RECOVERY ESSENTIALS

L. C. Skeen, general superintendent, Fordson Coal Co., Inc., Stone, Ky., in a paper on "Complete Recovery by Mechanical Mining," set forth the essentials of the system being used by his company at one of its mines, based on loading-machine operation and complete recovery. The seam is the Wallins, with an average thickness of 6 ft. under cover which varies from 90 to 1,050 ft. in thickness. Retreating from the outcrop, rooms are driven in units of three, the faces of which are maintained on a straight line front.

A unit, composed of a narrow room between two wide ones, is alternated with a unit composed of a wide room between two narrow ones. The narrow and wide rooms are driven 18 and 40 ft. wide respectively and 250 ft. long. On each side of every narrow room is a 12-ft. pillar.

These pillars are mined by slab cuts 30 ft. long for part of the pillar and 20 ft. long or less for the remainder, leaving pegs for protection where necessary. These pegs are recovered. Using one loading machine, this system has yielded nearly 100,000 tons of coal with only one injury, which was of a trivial nature.

MACHINES LOAD ALL COAL

A paper on "Mining in Wyoming by Mechanical Loading Exclusively," was delivered by Edward Bottomley, general superintendent of the Sheridan-Wyoming Coal Co. His firm operates two mines by mechanical loading exclusively and 50 per cent of the coal is loaded by machine in a third mine. He is of the opinion that the noise emanating from loading machines make their use in pillar work dangerous in comparison with recovery by hand loading. Nevertheless, no fatal or long-time disability accident has occurred in pillar recovery by machine loading, though several "close calls" have been experienced. Mr. Bottomley considers the shooting of coal the most difficult problem encountered in

mechanical loading, at least it has been so in the mines of his company.

In a paper on "Loading by Mechanical Methods Exclusively," written in his inimitable conversational style, David Ingle, president of the Ayrshire Coal Co., Indiana, reviewed the progress he has made in mechanical loading during the past year in particular, and during the last three or four years in general. An interesting addition to his loading equipment is a booster machine with a hopper, holding three tons, which serves as a reservoir for coal that is loaded by machine while cars are being shifted. This device has increased the output per shift of the loading machines 25 per cent over that produced by direct loading into cars. He points to the necessity for the development of better technique in the shooting of coal that is intended for loading mechanically.

Problems of shooting are not alike in any two places and the procedure followed in bringing down the coal successfully in one place more often than otherwise does not accomplish equally good results in another. Trouble with power voltage drop is a source of difficulty of such magnitude that he has decided to maintain motor generators in the middle of working sections, moving them as often as occasion demands. He has already attained a daily output of 9 tons per man on the payroll in a drive with a bogey of 10. When he reaches this goal he intends to aim higher and start all over again.

COAL AS ROOF SUPPORT

In the discussion, which was limited owing to the time required to read the six papers scheduled for this session, C. R. Stahl, general superintendent of the E. E. White Coal Co., of W. Va., said that any management installing loading equipment that does not plan to live with it might just as well cast to the winds the money expended. He believes that coal after all is the cheapest form of roof support and consequently is satisfied with a recovery of about 85 per cent, leaving the remainder where it will do the most good during actual mining. Harry S. Gay, Sr., general manager of the Gay Coal & Coke Co., of W. Va., thinks that a recovery of 85 per cent, such as is being attained at the Gay mine, is satisfactory if economical mining follows. One coal loading machine has been double shifted for three years in the Gay

mine, averaging an output of 400 tons per day, which represents 40 per cent of the 1,000-ton daily output of the mine.

Thursday Afternoon

DR. A. C. CALLEN, professor of mining, University of Illinois, Urbana, Ill., took charge of the session Thursday afternoon. The following papers on mechanical loading were presented at this session after which Mr. Dickinson of the Union Pacific Coal Co. showed several lantern slides illustrating underground loading and conveying practices of his company.

The paper prepared by George A. Schultz explained the experience of the Liberty Fuel Co. of Utah in the use of mechanical loading equipment. Though many changes in personnel, track layouts, etc., had to be made in adapting such equipment the company has been able to effect savings in operating costs as compared with hand loading methods. In selecting the equipment it was first of all agreed that the machine to be chosen must be one that would readily fit into the room-and-pillar method of operation. This was believed necessary because of the nature of the overburden.

The first machine installed early in 1926, was a Goodman hydro-electric power shovel and was put in operation in 7½- to 9-ft. coal. The rooms were driven uphill on the pitch of the seam which varies from 7 to 10 per cent. Rooms 28 ft. wide were driven and provided with a single track having a short parting or pass-by. This arrangement proved unsatisfactory because it was impossible to shift cars rapidly enough by means of animal haulage.

CARS CONSTANTLY SUPPLIED

Double tracks were then used and rooms driven on the strike. By keeping the tracks close together on one side of the room suitable space was provided for the shovel. This new arrangement enables rapid delivery and transportation of loaded cars so that the shovel can be kept constantly supplied with all the cars it can load. Cutting is difficult and requires much consideration because the shovels need a relatively smooth bottom on which to travel.

It has been found that the success of this method of loading depends to a large degree upon the way the coal is shot down. Best results in this



E. J. Christy

respect are obtained by placing five holes across the top of the room and firing them with delay detonators, and four holes 3 ft. above the floor fired with instantaneous detonators. Altogether these holes require 22 sticks of permissible powder and 55 tons of coal is shot down per room. Rooms are driven 1,000 ft. long and a cutoff is provided every 500 ft. to obviate the necessity for a large amount of track material.

The use of these shovels has reduced the average load carried by the cars from 4,300 lb. by hand methods to 3,100 lb. Because of the good grade of coal handled by the shovels practically no additional cost in cleaning has resulted. Faster transportation has kept the haulage costs down in spite of the reduced tonnage per loaded cars.

TEAR COAL FROM FACE

Besides loading out the coal the shovels are used to tear it from the face. This is necessary because it breaks in such a manner that it readily clings to the face. This operation, of course, decreases the time the shovels are actually loading and increases the maintenance costs of the equipment. Much of this difficulty is the result of leaving the kerf partially filled with bug dust. Water used on the cutter chains makes the bug dust set almost like cement on the lower side of the room much increasing the difficulty of removing it.

Everything considered the shovels have been quite successful and in an average of 7½ months for the two units, it has been found that the savings they effect over hand loading have already saved their cost.

It is believed that if heavier shooting could be resorted to and the

shovels double-shifted they would save their cost in less than four months. Actual records show that they have averaged 180 tons per 8-hr. shift. Even with a wage scale 33 per cent less than the Jacksonville rate the operating success of these shovels is worth much consideration where conditions are suitable for their use.

METHODS MUST BE CHANGED

In introducing his paper I. N. Bayliss, general superintendent of the Union Colliery Co., Dowell, Ill., stressed the point that mechanical loading is more or less in an experimental stage and consideration must also be given the fact that mining methods formerly used must be changed if best results are to be obtained.

Starting with a repair shop adequate for the mining equipment previously used it was soon realized that it would be necessary either to construct an additional underground shop or increase the facilities of the old one to take care of the loading machines. Consequently a new repair shop was built in the Kathleen mine at a point near where the loading machines were used. In addition to the usual equipment a pit and 10-ton traveling crane was provided.

The next problem was to get mechanics and after some consideration it was found necessary to train a corps of men. These were selected from young fellows who were first of all trained by the older men. They soon became quite proficient in their work.

The plan eventually evolved was one in which a mechanic is put in charge of all repairs on a mining unit consisting of a loading machine and its complementary set of locomotives, cutting machines, drills and shearing machines. He takes charge of all repair work except such breakdowns as necessitate the equipment being taken to the repair shop. His work is chiefly that of preventing breakdowns and reconditioning worn or broken parts. Additional repair men, generally stationed in the main underground repair shop, are available both day and night for emergencies or to maintain equipment that is relatively near the shop and consequently has no mechanic stationed with it.

Thorough inspection is another part of the maintenance plan. This is an effective means of knowing the condition of equipment at all times

and of locating weak parts. Besides the daily inspection given equipment, a complete weekly report is turned in to the electrical engineer who makes such recommendations as he deems advisable.

The use of loading machines has quite naturally necessitated the purchase of more underground equipment of various types such as locomotives, shearing machines, and drills; consequently maintenance costs in general have increased about 70 per cent for material and labor. Twice the number of repairmen are needed but less work is done on Sundays and at other idle periods.

On the whole the maintenance of loading machines is no more difficult than that for ordinary mining equipment when a well organized personnel is provided and eternal vigilance is exercised.

E. J. Christy, superintendent, Wheeling Township Coal Mining Co., Adena, Ohio, described the operation of mechanical loading in a seam averaging 4 ft. 8 in. in height and having a roof necessitating much timbering. Use was made in this bed of a loader, cable reel locomotive electric drill, cutter and 3½-ton cars, all operated by a total of eleven men. Room-and-pillar mining is done with face entries, driven on 1,050-ft. centers. The rooms are 200 ft. deep and 24 ft. wide.

First the place is cut and drilled. Next shotfirers load the holes and two snubbing shots are fired while two rib shots are still uncharged. The coal thus brought down is loaded out by machine and a jack is placed under the drawslate before it falls. The loading machine operator then fires the rib shots on one side of the room and another jack is put in position. He then shoots the rib shot on the opposite side of the room and loads out the coal. Afterwards the room is cleaned of all other loose coal which is put in position for loading by a helper.

A timberman sets several rows of posts after the cutting machine has done its work. This is necessary because of the bad roof conditions and undoubtedly adds much to the cost of mining.

At present approximately 14 per cent of the coal is loaded by the above method and the tonnage per man employed in the work has about doubled with the additional advantage of a greatly reduced accident hazard.

The presentation of the paper pre-

pared by George F. Osler, vice-president, Pittsburgh Terminal Coal Corp., Pittsburgh, Pa., dealt with one drawing of pillars in the Pittsburgh seam by the use of conveyors.

In this bed the roof slate is usually about 12 in. thick. Primary mining is carried on with the idea of leaving the pillars for roof support and later going through the workings drawing pillars and controlling roof breaks. Conveyors are installed for second mining, being first set up in a cut that splits the pillars. These conveyors load and carry the coal out to a main haulageway. The thought was expressed in the paper that presentation of the subject must be made carefully so that a negative point of view would not be gained by reference to the difficulties encountered. Conveyors are at present being successfully applied to both pillar drawing and longwall methods of mining. The elimination of haulage from working face to main road is important because of the temporary nature of equipment that must be used. Conveyors enable reclamation of pillars in thin coal whereas other methods would be difficult and expensive.

In describing the use of mechanical loading in entry driving at the No. 8 mine of his company, O. S. Newton, general manager of the Sunday Creek Coal Co., Columbus, Ohio, explained the conditions under which the machinery was working.

MACHINE HAS THREE BARS

To develop a territory heretofore not mined it was necessary to drive through the "Jumbo Fault." After carefully drilling the territory it was learned that about a mile of deficient entry through coal of varying thickness had to be driven. This work was begun in 1925 and a 20-ft. tunnel 1,046 ft. long was driven. A combination loading and cutting machine was used together with sectional and transfer conveyors. The machine employed has three bars. The lowest does the cutting while the two upper ones are swung back out of the way. When the coal has been cut and shot down the machine is put in position for the three bars to load it. Bits on these bars drag the coal back to the conveyor which carries it to a swinging conveyor which in turn discharges into a mine car.

Six men were employed to operate the machine, drill, shoot, tend the conveyor and do the hauling. The total wage cost is \$50 per day. Cutting

was difficult in this work because the bottom of the seam contained many sulphur balls. Bits had to be changed from one to seven times per crossing. This interfered with the efficient and rapid operation of the machine.

Experience showed that successful operation of the machine depended upon thoroughly breaking the coal at the rib. Unless this was done the coal tended to bridge across and hold tightly in place. Three men can cut, shoot and load one cut per 8-hr. shift by this method and the use of the equipment mentioned. The total saving over hand-loading methods was 14.7c. per ton. This figure includes labor, repair parts and power. An important feature, however, is the fact that the work is done three times as rapidly by machinery as by hand work. In 6-ft. coal the savings effected by this method of mining were 48c. per ton and the work is carried on at a rate four times as fast as by hand loading.

In summarizing Mr. Newton expressed confidence that mechanical loading will solve the industry's labor problem, increase capacity with fewer men and reduce costs while at the same time permitting the workmen to earn good wages.

Edward Graff, Macdonald, W. Va., in his discussion of the paper emphasized the necessity of having perfect accord between the workmen and executive personnel regarding the possibilities of mechanical loading.

Mr. Farnum of the Goodman Manufacturing Co. discussed the paper of Mr. Schultz and referred particularly to the structure of Utah coal which caused fractured pieces to remain locked to the face and rib. By using hydraulic power for crowding and jacking the machine into place a 6-ton crowding effort can be exerted by the machines. The lifting power of the machine is 3 tons with the boom fully extended and approximately 5 tons when handling material at close range.

Friday Morning

SAFETY and mine fires occupied the convention at the Friday morning session at which W. L. Robison, Youghioghenny & Ohio Coal Co., Cleveland, Ohio, presided. The chairman declared that safety is an important item in mine operation, both from humanitarian and economic reasons. The loss of the force of competent men by accident

and the compensation payments combine to make unsafe operation uneconomic, subjecting the operator to a double loss. Much as the operator loses from unsafe conditions, the workman has even more at stake. Too much emphasis could not be placed, said Mr. Robison, on the importance of safety provisions to the industry.

Dean E. A. Holbrook, of Pennsylvania State College, State College, Pa., who was scheduled for an address on the subject, "Shall a National Safety Code Be Developed?", said that he reserved his remarks and would present them at the meeting to consider that subject which would be held the following morning.

W. D. Brennan, general manager, Stag Canon Branch, Phelps Dodge Corporation, Dawson, N. M., who was to discuss "Safety Features in Mechanical Mining," was not present. His paper was presented by A. W. Dickinson, general superintendent, Union Pacific Coal Co., Rock Springs, Wyo.

Mr. Brennan's paper declared that too much loading machinery was supplied with ineffectual guards. He said that in working by the retreating system, it had been found necessary to stop the mechanism at intervals to enable the men to take note of the noise made by roof action and thus to provide where necessary for safety. The presence of the face boss did much to make mechanical loading safer than hand operation.

Accidents were caused by the ropes on scraper loaders and also by the pans of shaker conveyors flying off their idlers. By the aid of line brattices the air at the end of retreating pillars has been successfully passed along the face, thus providing good ventilation to the face workers.

REDUCE EYE ACCIDENTS

All men at the face are required to use goggles. Since Jan. 1, only two eye accidents have occurred. The coal is quite fragile and flies off the face. Before the goggles were used two to five accidents from flying coal occurred per month. Now the company is insisting on the use of "hard-boiled" caps in the coal mines. Where they have been installed in one of the metal mines of the same company, they have practically prevented the occurrence of head accidents from the falling of rock. They have unquestionably saved several lives during the present year. The cost of compensation has been cut

\$1,278.28, or 25 per cent, for the first quarter of 1927 below that for the corresponding period in 1926.

Mr. Dickinson, commenting on the paper he had read, said that there had been no fatality from machine loading in 1926 in the mines of Wyoming, though 1,250,000 to 1,500,000 tons had been thus loaded. Much credit is due to Edward Bottomley, general superintendent, Sheridan-Wyoming Coal Co., for his part in this excellent showing. Unfortunately, the year 1927 will not have as clear a record because a timberman was killed in March of this year. The Union Pacific Coal Co. was endeavoring to prevent a repetition of such an accident by "strap-



W. D. Brennan

ping" and in a measure "forepoling" the weak mine roof.

Pans, said Mr. Dickinson, had not, by leaving the idlers, caused any accidents in the mines of his company, but a man who was making time studies was hurt at a chute. The Colorado Fuel & Iron Co. was requiring its men to wear goggles. At the Union Pacific Coal Co.'s mines, one of the safety patrolmen had induced all the 150 men under his control to buy screen goggles which cost 35c. apiece.

Clyde A. McDowell, assistant to the general manager of mines, Pittsburgh Coal Co., Pittsburgh, Pa., discussed the best means of keeping accident prevention to the forefront. He emphasized the necessity of conforming the nature of the safety message to the intelligence of those who were to receive it. The same instruction would not do for everyone. He advocated periodical meetings



J. J. Forbes

for department heads, others for men of certain specific occupations as haulagemen, pumpmen and shot-firers, and also employees' meetings for all those employed at any given mine or plant.

Mr. McDowell urged that every employee be trained until he is eligible for a U. S. Bureau of Mines' first-aid certificate. He mentioned one company that had instituted a National Safety Council trip contest. The company sent, to the annual meeting of the council, the superintendent with the lowest severity rate, the foreman with the lowest frequency rate, and the employee with the highest number of merits for first-aid treatments and safety suggestions.

He advocated that one man in every ten be instructed in mine-rescue work, and that procedure should be worked out to be put into effect in case of a mine fire or explosion. Most accidents should be subjected to careful investigation.

PHONE NEWS OF ACCIDENTS

At one group of mines, the inspector receives telephonic messages regarding all accidents, and decides at once if a board of inquiry is needed. At this meeting, a superintendent and foreman from another mine may be brought in if the accident is of major severity. The findings are made known at all meetings and graphically explained on bulletin boards.

Edward Graff, mining engineer, New River Co., Macdonald, W. Va., discussing this paper, urged the importance of getting the management vitally and continuously interested. He advocated the placing of center



J. T. Ryan

props in the ends of room roadways when coal is being loaded.

J. D. Rogers, chief engineer, Stonega Coal & Coke Co., Big Stone Gap, Va., discussed methods of instructing men to teach both safety and better foremanship. Toward the end of the year 1921, J. C. White conducted two improved foremanship conferences, only Stonega employees being present. The first was for superintendents of mines, the safety engineer and picked members of the engineering department. The second was for mine foremen and assistant mine foremen who had not attended an earlier foremanship conference at Norton, Va.

SIX CONFERENCES

Six separate conferences were held in 1922, in which about 600 men took part. Certificates were awarded by the State Board of Vocational Education. Five evening meetings a week were held for three weeks, and those who attended twelve of these received certificates. In March of the present year a "Teachers' Training Class in Mine Safety and Accident Prevention" was held at Norton, Va., under the aegis of the Virginia Coal Operators' Association, the Virginia Department of Vocational Education and the U. S. Bureau of Mines.

This lasted three weeks. The students had to take 90 hr. of training. At these meetings, 23 men attended from the mines of Virginia. Safety work was emphasized, especially the teaching side of safety. Sixteen conferences have since been held, led by men who received their training at the Norton Conference. Mr. Rogers spoke most highly of the

results attained by these novel educational methods.

J. J. Forbes, supervising engineer, U. S. Bureau of Mines, Pittsburgh, Pa., briefed a paper on the organization needed and the factors governing safe and successful unsealing of mine fires. Whether a mine is gassy or not gassy, the unsealing of a fire is always hazardous. The oxygen must be sufficiently low, carbon monoxide must have disappeared, and the sealed area must have cooled down, before unsealing is attempted. The presence of carbon monoxide shows that the fire is still in progress.

Where the roof caves over the fire and where the roof thus caving contains combustible material, the unsealing must be delayed. If gas wells are found in the area or adjacent thereto, the hazard of unsealing is increased. High-volatile coals burn faster than low-volatile and make a fire that spreads rapidly, be-



F. B. Dunbar

comes exceedingly hot, and tends to re-ignite when unsealed.

Where the area is under pressure means may have to be provided for bleeding off the fire gases. The oxygen content of the atmosphere within the sealed area should constantly decrease if the fire is to be subdued. In order to get true analyses they should be taken where the pressure of the sealed area is outward and not inward, or the sample will not be worthy of confidence.

The atmosphere should be sampled once daily for the first few days. Afterwards, the sampling may be done less frequently. Mr. Forbes said that when the oxygen is reduced to 12.1 per cent, flame propagation and an explosion of methane are im-

possible. Unfortunately, methane is not the only explosive gas that may be behind the seals. Besides methane, there may be carbon monoxide and hydrogen and other combustible gases. Where the oxygen is below 4 per cent, no gas seems able to explode.

However, one needs leeway. Unsealing will admit air, do what you may, so that it is better to have the oxygen reduced to 3 per cent, and 1 per cent would be better. Besides, there is the risk of leaky seals and also of leakage of all kinds should barometric pressure favor the passage of air. Coward and Hartwell, said Mr. Forbes, have shown that 25 per cent of carbon dioxide is necessary to render methane-air mixtures incapable of propagating flame. Seeing that the proportion of carbon dioxide rarely exceeds 6 per cent, that gas must have little effect in preventing inflammation.

Mr. Forbes called attention to a new conception, that well-substantiated as it is, shows how inefficient even the best of stoppings are to prevent inleakage. If on one side of a fire area the mine current is an intake, and on the other a return, some of the air is likely to pass through the fire area and prevent its entire extinguishment.

OXYGEN CONTENT VARIES

At Oakmont, a mine of the Hillman Coal & Coke Co., a fire occurred, and the oxygen content which was 15.45 per cent on Jan. 15 dropped in nine days to 4.2 per cent. It then varied, going up and down, and on July 10 was 4.7 per cent, a most unsatisfactory showing.

The water gage at the mine was about 3 in. One side of the fire area was an intake and on the opposing side a return. When the air was made to circulate as an intake all around three sides of the sealed area, the oxygen content began to fall, and on Oct. 8 it was 0.4 per cent. The carbon monoxide had fallen to a trace on July 10. It speedily ceased to be found at all after the air pressure on those sides of the fire area was made more nearly uniform.

In opening a fire area, it is necessary to make adjustments so that the return from the unsealed area will reach the surface through the main return. The electric power should be cut off the entire mine before the unsealing begins.

J. T. Ryan, vice-president and gen-

eral manager, Mine Safety Appliances Co., Pittsburgh, Pa., who had just returned from the Everettville explosion and mine fire, explained why it was necessary to seal the workings before removing the bodies of the men in the mine. There was every evidence of much methane and also much smoke. Two distinct exploratory parties were sent in to make certain that the first reports were correct. As the findings of all the explorers agreed, the area was sealed. An analysis made soon after showed 4.4 per cent of carbon monoxide, 3.44 per cent of methane, and 11.4 per cent of oxygen. The analysis before sealing was about the same.

It was a wonder that the mine did not explode and kill all the rescuers. With such a percentage of carbon monoxide in the area to be placed under seal, no men could live. It is more than has been found after an explosion at any mine, other than the Bureau of Mines experimental operation at Bruceton, Pa. At the Horning explosion and the Oakmont mine fire, the highest carbon-monoxide proportions found were 1.6 per cent. Such a high percentage of carbon monoxide is deadly, not only owing to its toxic qualities, but also because it might explode, at any time.

Prof. Edward Steidle, Carnegie Institute of Technology, Pittsburgh, Pa., presented the tables included in his paper, which was a summary of the safety appliances and accessories used in mine-fire fighting and recovery operations.

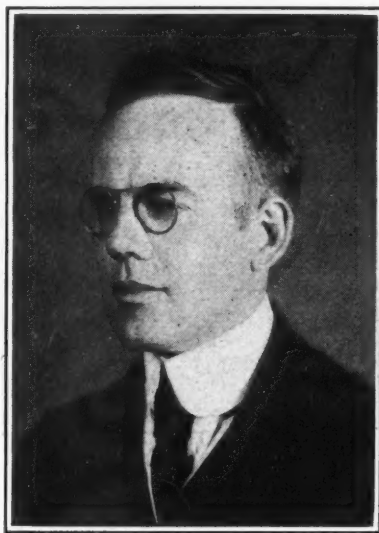
CANARY BIRD OBSOLETE

He said that it seemed likely that it would soon be recognized that the distinguished rôle of the canary bird as an indicator of carbon monoxide was of the past. The carbon-monoxide detector is a rapid and more accurate guide. Different canaries have different reactions to carbon monoxide, so the test by the canary cannot be standardized.

Frank Dunbar, general superintendent, Hillman Coal & Coke Co., Pittsburgh, Pa., credited George McCaa with having suggested the reversal of the air near the seals at the Oakmont fire as a means of lowering the percentage of oxygen in the inclosed area.

He discussed the sources of mine fires and urged the proper installation of trolley wire which should be, he said, of the proper size. Trolley

hangers should be inspected to be sure they were not leaking energy. He said that accumulations of coal dust might result in such leakage, and he desired particularly to call attention to the fact that rock dust on the hangers might have the same effect. In fact, at the Hillman Coal & Coke Co. mines, whenever the entries are rockdusted, a man is directed to brush the rock dust off



Edward Steidle

the trolley hangers so as to prevent any such leakage.

He urged that no hanger be attached to an overcast. A hanger should be put, he said, on either side. Presumably, he was talking of overcasts of ferro-concrete construction, but there is a risk with wood overcasts, also, but of a different nature. He instanced one place where he had found much leakage and heat from a ferro-concrete overcast on which a pipe had been laid. Beware, he added, of putting trolley hangers on door frames. One can be placed just inbye and one outbye.

Furthermore, he counseled, do not place a rail joint at a door, because there may be an arc if the bonding goes awry. The wiring to stationary motors should be safely installed or it may cause fires. Switches should be placed outside, not inside, underground buildings such as mine-foremen's offices.

Rails, cables and pipe in old workings should be removed. The end of these may be near a piece of track and leak electricity thereby heating coal along the path of the current. They may also be used by someone as a return with a similar result. Mr. Dunbar recommended that an electric light be installed that will burn

so long as the switch for any heading is closed. The fire at Oakmont would not have happened had there been such a tell-tale light. The foreman passed the switch after the day's run and did not notice it was closed. Had there been a light, he would have noted that it was not as it should have been at that hour.

It was true he did not know that several cars in the roadway had run away, had been wrecked at the bottom of a "swag" and had torn down the trolley wire which in turn had made a short circuit sufficient to start a fire, but not enough to throw out the circuit breaker.

DANGEROUS ECONOMY

No company can afford to eliminate the fire run on idle days or Sundays. It is a tempting but hazardous piece of economy. If a fire is allowed to get a start, the expense is considerable. At Oakmont, the fire soon achieved large proportions because of the cannel coal in the roof at that mine which burns with great heat and rapidity.

Mr. Dunbar said he did not know whether the intake or return should be shut off first. He supposed the difference of opinion would never be reconciled, but he was certain that *never* should one man reverse the air on another.

Mr. Dunbar said the explosion had proved to him that the plan of operation at Oakmont was inadvisable. One heading of each pair of room headings was driven through the barrier pillar so as to connect the gobbs of the extracted area with the chain heading beyond, for the purpose of bleeding off gas. Mr. Dunbar said a pair of rooms could have been provided from each pair of room headings that would have carried the air to the main butts. Then instead of five stoppings, two would have served and much air leakage would have been prevented.

Robert M. Lambie, chief inspector, State of West Virginia, Charleston, W. Va., gave some details of the Everettville explosion, indorsing the sealing of the workings. He said that the Consolidation Coal Co. is devising its working plans so that four seals will suffice to enclose any panel. He declared that at the Everettville mine the sealing was done to keep gas made in the gassy parts of the mine from entering the fire area.

Daniel Harrington, chief of the safety research division, U. S. Bureau of Mines, Washington, D. C.,

because of the lateness of the hour, did not present his paper. The article by Robert McAlister, chief inspector of coal mines, fuel department, Colorado Fuel & Iron Co., Trinidad, Colo., was not presented, owing to the absence of the author.

In conclusion, W. L. Robinson, the chairman, said that he was much interested in the proposal, to be discussed on the following day, of uniform laws for the coal-mining industry. He believed that laws should not be uniform, where conditions were far from similar. Too many officials would be required in some mines to comply with the conditions found in mines more dangerous. Too few officials would be provided in the more dangerous mines. A sort of balance would be struck, where nature had made no balance. The laws that were to be enforced on all mines could not be made as strict as those which could be imposed without injury on the more unsafe. The effect of uniformity would be too much cost in the safe mines, too little safety in the hazardous mines, and all to no purpose whatsoever.

Friday Afternoon

ATTEendance at the Friday afternoon meeting was small compared to that at earlier sessions. Erskine Ramsay was chairman, and the subject discussed was "Cutting and Blasting."

T. W. Guy, general superintendent, Boone County Coal Corp., Sharples, West Va., discussed the subject "Under What Conditions Should Top Cutters Be Used." Bad roof and impurities near or at the top of the bed are conditions which, in his opinion, call for careful consideration of top cutting.

He described the changes necessary and results secured from shifting from bottom to top cutting in the Chilton bed, in mines where, at the top a 3 to 4 in. bone and rash, and above that draw slate varying from 18 to 54 in. in thickness is found. Use of over-cutters and the leaving of from 6 to 10 in. of roof coal, reduced the labor and supply cost approximately 20 per cent in one month.

In another mine of 62 in. height, where only 2 to 3 in. of top coal was left to support the bone-coal and roof, top cutting was abandoned because the roof support was not effective.

In enumerating the advantages of top cutting and leaving top coal,

in the Boone County corporation's mines, he stated that the cutting cost is approximately 20 per cent less than it was with shortwall machines. Among the disadvantages he cited that more explosives are required to shoot the coal upward, and that the



C. E. Carden

difference in lump is 3 to 5 per cent less.

Application of top and bottom cutting machines was discussed by William Z. Price, assistant to the president, Warner Collieries Co., Washington, Pa. He described the several applications of top cutters in



Roy T. Lyons

Pennsylvania and northern West Virginia to remove parting, to cut coal which gave trouble by setting down on an under-cutter, and to hold roof.

Mr. Price called attention to the bottom cutting machine which cuts

from the track, and he predicts a wider use of this type.

C. E. Carden, assistant superintendent, Gauley Mountain Coal Co., Jodie, West Va., discussed blasting practices at the mines of that company. The four mines are in the Big Eagle and Winifrede seams, and each produces about 350 tons per day.

PELLET POWDER SAFER

About a year ago, pellet powder was put into use in these mines in place of loose powder. Separate small magazines for the powder and blasting caps were built at each mine and the explosives distributed daily. Each loader is required to have a bug dust shovel for cleaning the cut. Clay is used for stemming, and the old miners' squib for firing. Fuses are not used because of the danger from short fusing. Electric firing may be inaugurated later.

In these mines the proportion of lump coal over 4 in. screens averages about 52 per cent and the tons production per pound of pellet powder, 4.7 tons. Undercutting machines are used.

W. J. German of the DuPont company called attention to the fact that pellet powder was developed only to put black powder in safer packages for those companies that are continuing to use black powder, and that pellet powder has not been pushed by the manufacturers or their salesmen to replace permissibles.

An interesting description of blasting and preparation for mechanical loading in Michigan was given by Roy T. Lyons, chief engineer, Consolidated Coal Co., of Saginaw.

The seam varies from 3 to 5 ft. in thickness and has a hard band about 6 in. thick, at a point 12 to 18 in. above the bottom. The face is prepared for the scraper loader by shooting holes drilled in the top coal adjacent to the band. The band and bottom coal are then taken out, the refuse gobbled, and the bottom coal put to one side before the top coal is shot. The top coal is brought down with Red H.C. dynamite cartridges 1½ in. in diameter loaded into 1½ in. holes. With hand loading, in which practice 40 per cent dynamite is used, the cost of removing the band is 10c. per ton, but with the system described for mechanical loading it is 12c. per ton. The increase in lump, however, which is 8 per cent, more than compensates for this difference as compared to hand loading.

Great Diversity of Equipment Shown at The Cincinnati Convention

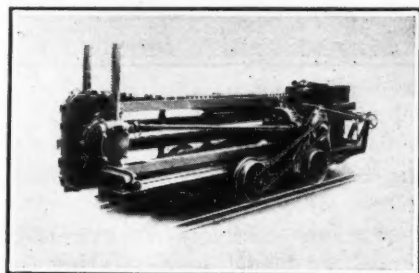
Exhibits Ran the Entire Gamut of Apparatus from the Humble Shovel to Automatic Sub-Stations—Mechanical Loading Machines Were Much in Evidence and Attracted Full Share of Attention

By Staff Correspondence

EXCEEDING most expectations, the machinery exhibit held at Cincinnati in conjunction with the regular meeting of The American Mining Congress was bigger and better than ever before. The exhibits overflowed the regular hall into the corridor or vestibule and overflowed this into the South Hall and into a large tent in front of the building.

It would be futile to attempt any description of the entire exhibition. All that can be done here is to enumerate, so far as possible, the strictly new devices that were shown, giving a brief description of each. No logical plan will be followed, but the various pieces of equipment will be described in approximately the order in which the *Coal Age* staff found them.

In the upper end of the north aisle, the Goodman company exhibited a



Goodman Center Shear

The cutting element of this machine looks much like a breast machine turned up on edge. It is raised before being fed forward into the coal and does most of its cutting on the down stroke.

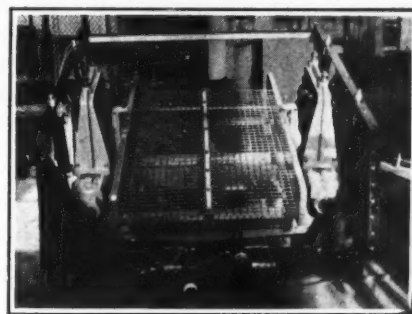
new shearing machine which cuts a vertical kerf in the coal face 5½ in. wide and approximately 8 in. to the right of the center line of the track. It is stated by the makers that this machine is self-propelled, easily operated, rugged in construction, and rapid in performance. It remains stationary upon the track while cutting. The cutter arm is raised by power and the entire cutting element, including motor and driving gear train is pushed forward in the supporting frame which is held rigid by means of a jack at its rear end. The clutch controlling this forward

movement is automatically kicked out when the bar has reached the limit of its travel. The cutter arm is then fed downward by hand, through the medium of a ratchet lever. It may be raised or lowered during sumping so that unevenness of the roof may be followed. Good performance may be secured even though the machine may rest upon rails that are merely laid in place, without being fastened to ties, or other supports.

The Atlas Powder Co. exhibited its key-operated blaster known as its No. 2. This is built upon the generator rather than the magneto principle. It is claimed by the maker that the working parts are of substantial construction and thoroughly protected from all ordinary conditions of dust, dirt and moisture. The capacity of this machine is not lowered by jolting or jarring or by short-circuiting the terminals. The electric circuit is insulated from the case, thus preventing shock to the operator. The firing switch is positive in operation and will remain in adjustment. The machine itself is light and compact, being of a size that may be carried in the pocket. Nevertheless, its capacity is ten 30 ft. copper, or ten 6 ft. iron-wire electric blasting caps in single series.

The Coloder Co., of Columbus, Ohio, exhibited a model of its new

Type H Coloder. This is a loading machine which operates by frontal attack upon shot-down coal at the face from the room track. It consists essentially of two conveyors,

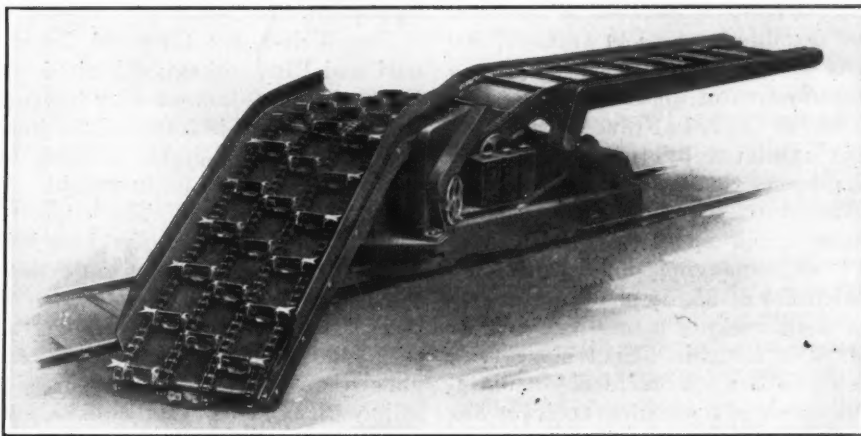


Traylor Vibrating Screen

The machine here shown is of sufficient size to handle 100 tons of coal per hour. The power consumption is almost negligible being slightly less than ½ hp. The motor-generator set in the foreground appears larger in this picture than it really is.

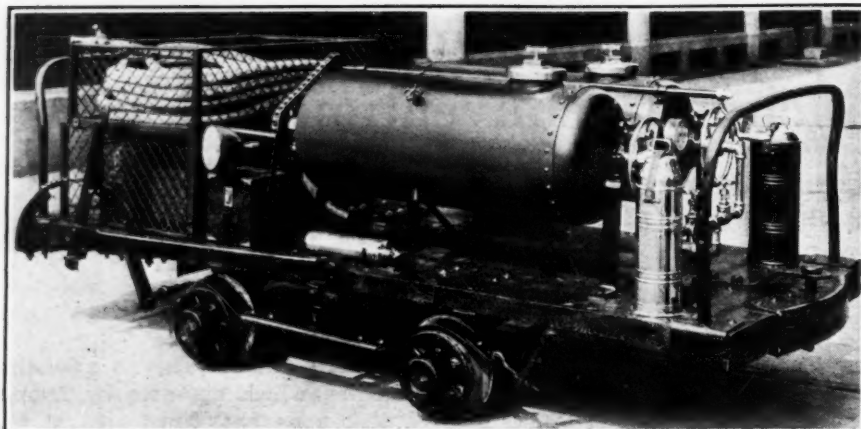
each mounted pivotally on a four-wheel truck. It is entirely under the control of one man and either conveyor may be raised, lowered or swung from side to side through an angle of 90 deg.

It may be built in any track gage from 36 to 48 in. and from 26 ft. to 39 ft. long. Its maximum height is 4 ft. above the rail; its width 5 ft. 8 in.; its wheelbase 52 in., and its weight 8 tons. The gathering conveyor is a multiple chain with dig-



Frontal Attack Coloder

This machine is built primarily for operation in narrow places. Note the construction of the digging or pick-up chain. Staggering the digging flights on the multiple chain relieves the stresses on this conveyor and tends to make the stream of coal fairly uniform in volume.



Underground Chemical Fire Engine

Two chemical tanks of large capacity together with hand extinguishers, hose, tools and the like are all mounted on this truck that can be readily transported from place to place within the mine. Thorough preparation for trouble underground is one of the surest preventives of mishap.

ging flights. It is capable of cleaning up rooms from 18 to 22 ft. wide.

What was probably one of the most ingenious machines shown in this exhibition was the "Screen Supreme," manufactured by the Traylor Vibrator Co. of Denver, Colo. The remarkable feature of this device was its high capacity with low power consumption. This machine using a combination of both direct and alternating current, had 3,600 vibrations per minute. These were of small magnitude and so rapid that the eye failed to detect them clearly. They could be felt better than they could be seen. There were no moving parts in the screen itself, the screen bed being hung from shock absorbers. It is claimed by the maker that the rapid sharp vibrations keep the coal in loose contact with the screening surface, while the material itself is handled gently. The power consumption is almost negligible. The machine exhibited, having a capacity of 100 tons per hour, consumed approximately $\frac{1}{2}$ hp. One of these screens is installed in the West for handling ore. It treats 7,500 tons of ore per shift with a power consumption of approximately $\frac{1}{2}$ hp.

An M S A-LaFrance fire truck was exhibited by the Mine Safety Appliances Co. of Pittsburgh, Pa. In addition to the two main chemical tanks which appear prominently in the accompanying illustration and which are of 35, 45 or 60 gal. capacity each, making a total capacity of 70, 90 or 120 gal. This truck carries two carbon tetrachloride extinguishers and a chemical refill for one of the larger tanks. The truck also carries a headlight, set of tools, six Burrell all-service gas masks, one carbon monoxide detector, 200 ft. of

hose together with the necessary nozzle, spanner and the like.

This company also showed the new 2-hr. MaCaa oxygen breathing apparatus. This weighs complete only 35 lb. and rides upon the wearer's hips as well as his shoulders. It embodies improved expansion and admission valves, and a Cardoxide container for purifying the exhaled air. This is connected direct to the cooling chamber, thus minimizing the possibility of leakage. The breathing bag is vulcanized into one piece, thus lessening the danger of this element coming apart. The wearer's shoulders are free, the breathing tubes passing under the left arm.

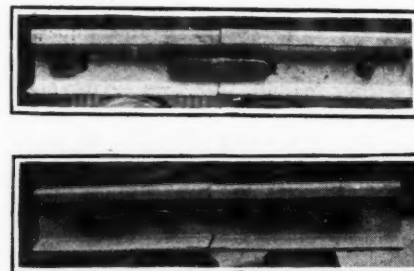
A continuous methane detector was also exhibited by this firm. This device draws a sample from the main return, or from any split. It produces a 24-hr. circular chart similar to that made by a Bristol recording gage. It will indicate as low as 0.02 per cent of methane. The device is particularly valuable to the fire boss before making his regular morning inspection.

The Weir-Kilby Corp. of Cincinnati and Birmingham, exhibited the Karr boltless non-rusting spring splice bar. This is intended for joining only rails of light sections, or those up to, say, 40 lb. in weight. It consists of two parts. The longer of these passes through the two bolt holes farthest from the rail ends: the shorter passes through the end holes from the opposite side of the rail and its hooked extremities engage the longer strap, binding it solidly against the rail webs, just under the head or ball. Both of these straps are self-locking in position and a hammer is the only tool required to place or remove them.

Allen & Garcia, of Chicago, Ill., exhibited a model of their new skip hoist. This is so arranged that the fall of the coal during skip discharge is a minimum. The discharge lip of the skip itself comes to the dumping point and remains approximately stationary, while the skip revolves, or tilts upward around it. The model shown also incorporated an improved loading gate that obviates the necessity for a measuring hopper.

The Rome Wire Co., of Rome, N. Y., had on exhibition its new super-service cable guard. This device is composed of tough vulcanized rubber and is clamped to the sand pipe of a locomotive, forming a shoe that straddles and just clears the rail. If the cable reel ceases to function and the cable falls across the rail, this shoe will push it along until the locomotive can be stopped. This device has been tried out successfully in several mines and will be placed on the general market within a very short time.

The Chance Coal Cleaner Co. and the equipment corporation of the



Spring Rail Fastener

Only a hammer is needed to put this fastener in place, or to remove it. It consists of two parts that interlock with each other and hold the two rails firmly in place.

same name exhibited an extremely interesting model demonstrating the Chance process of coal flotation. In this model large and small pieces of coal could be seen actually floating on a mixture of sand and water kept in continuous agitation. Changing the flow of water to the model would effect a visible change in the operation of the machine.

The Carnegie Steel Co. of Pittsburgh, Pa., showed several new structural sections suitable to building and mine use. The H-sections of this series are particularly interesting, their flanges all having parallel faces. The mine tie sections built by this firm, also were recently reinforced, securing greater strength. The outer or stationary clip is now rolled to fit the base of the rail; this prevents even slight spreading of the rails forming the track.

The Weinman Pump Mfg. Co. of Columbus, Ohio, had on exhibit, its improved type P self-oiling gathering pump. The improvements embodied in this design are practically confined to the valve chest and mechanism; removal of the chest cover or water cap, allows full and complete access to all valves. These together with their seats, springs and other mechanism, are mounted on a plate that is readily removable entire. The design is such as to minimize wear on the various working parts. The pump exhibited was also fitted with a new suction strainer, although this part is ordinarily sold separately, or as an extra. The basket of this strainer may be removed and cleaned in about half a minute without the use of tools.

MINE HAND CAR SHOWN

The Morgan-Gardner Co., of Chicago, exhibited its "Mine Scooter." This is in reality a motor-driven section car, intended for transporting men, rails, track tools and the like throughout the line. This little car has a minimum height of 18 in. from the rail and a minimum weight of 925 lb. Its speed is approximately 8 miles per hour, and its carrying capacity is 1,000 lb. It is fitted with motor, trolley pole, controller, headlight, and similar appliances much like a miniature mine locomotive. The standard scooter is fitted with a railing along either side and has a spacious tool box under the platform.

The journals are provided with Hyatt roller bearings and the track gage may be anything from 36 in. upward. The headlight can be turned in any position desired. It may also be detached and with the aid of a drop cord, carried to nearby work.

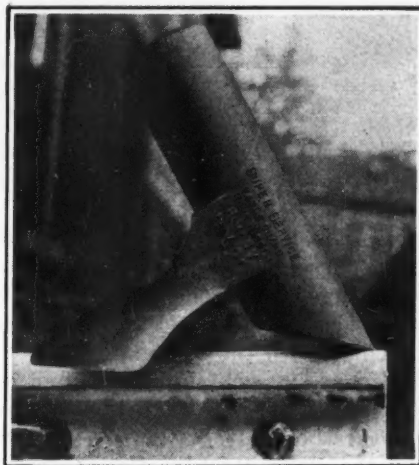
The Simplex Wire & Cable Co. exhibited a new extra-heavy twin cable for use with permissible equipment. The two conductors in this cable are separated by a special reinforcement which in section is in the shape of an I-beam. This in the No. 3 size provides a separation between the conductors of about $\frac{1}{4}$ in. When this cable is run over by the truck wheels of the machine the tendency of the conductors is to separate instead of be forced together.

This company also showed for the first time a cable feeder called Condex that is adaptable for underground power distribution where vertical suspension is not necessary. It consists of a standard rubber or varnished-cambric insulated cable over which is applied a covering of

jute, an arched steel tape, with a covering of jute over all. The design of the arched steel tape is such that each turn is locked to those convolutions adjacent to it.

The Hockensmith Wheel & Mine Car Co., presented an elaborate line of new haulage accessories: (1) A track sheave, mounted on anti-friction bearings, so designed that the wearing element or roll, made of steel pipe, can be replaced in a few minutes. (2) A sheave mounted on anti-friction bearings, with a chilled face consisting of five wearing grooves. (3) A bell knuckle, chilled face sheave, mounted on anti-friction bearings in pedestals, for heavy duty.

Two new features of mine car construction were also shown. One was a roller-bearing equipped mine-car wheel with a disc cap which fits against a shoulder within an extended hub. This disc is held in place by a ring spring, for ease of assembly, and is fitted with an outside Eureka valve. The extended hub lends itself to rotary dump operation without interference by bolts or lock washers. The other feature of mine car equipment was a revolving cast-steel draft gear with self-aligning

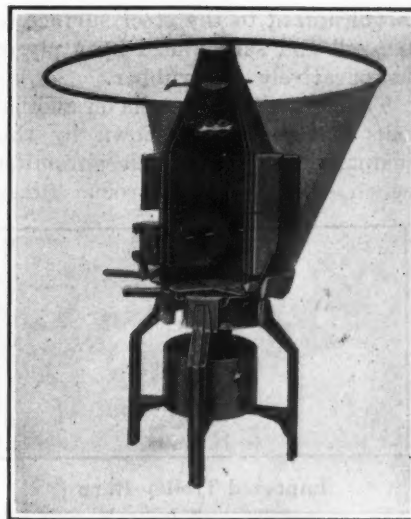


Rubber Cable Guard

This guard clamps to the sand pipe of the locomotive and pushes the cable out of the way of the drive wheel until the machine can be brought to a stop.

features that has been especially developed for rotary dump operation. The entire draft gear can be removed without disturbing any other element of the car.

The LaBour Co., Chicago Heights, Ill., showed actual operation of a mechanical gathering valve, not dependent upon or subject to any adjustment, intended for pumping service where automatic control is not provided and where suction lines are



Improved Sand Dryer

Do the legs of a pot increase its heating surface? This sand dryer is built on this principle. The fins on its sides much increase its rapidity of action and overall efficiency.

long or perhaps run to several sumps at different elevations. The valve is connected to the end of the suction lines and is controlled entirely by the rise or fall of the water surrounding it. This valve is float controlled but not float operated, the suction of the pump operating it and the float mechanism locking it. It is constructed of a highly acid-resisting alloy steel which has been developed by the company.

HANDLES CARS GENTLY

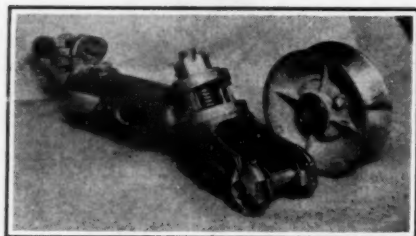
The Mining Safety Device Co., Bowerston, Ohio, exhibited a working model of the new Nolan automatic mine car feeder for use in conjunction with cages, dumps, etc. This device is intended for feeding trips of any length on heavy or light grades with brakes on all cars released.

The stop mechanism engages the bumper of the first car and is unlocked as the cage or dump assumes a loading position. In moving forward the first car folds down the stop, thereby closing horns immediately in front of the forward wheels of the car next in line. This is done without jar and consequently the cars are not damaged in the operation.

The Link-Belt Co., showed a belt-conveyor idler roll with a new feature of design, namely, a covering of rubber which is intended to eliminate slippage and consequent wear of the belt passing over it. Being resilient, this rubber cover also takes the impact of the conveyor load without injury to itself or the belt. The cover consists of a hard rubber core which

is vulcanized to the steel surface of the roll and surrounded by a ply of comparatively soft rubber.

The surface of the rolls on another belt conveyor idler shown by this company is plated with chromium which resists sulphurous fumes



Improved Trolley Harp

The arrangement of parts is such that current is transmitted not a one through the axle of the wheel but through the washers on the side as well.

around coke plants and prevents pitting and rusting in coal-plant service. The new low type of Link-Belt, Kangaroo (shaking) conveyor drive was illustrated by a photographic display. This mechanism complete with motor is mounted on a single steel bed plate, the ends of which are slightly rolled to facilitate moving.

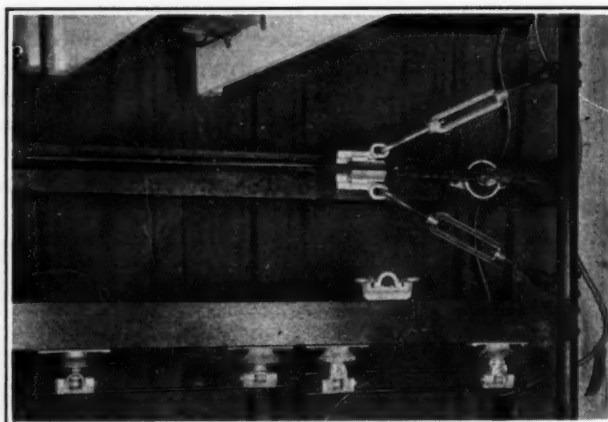
The drive unit and the motor are each totally inclosed. The splash system of lubrication is supplemented by an auxiliary pump system of oiling. Equipped with a 15-hp. motor, the total weight is 4,000 lb. Its overall height is 22 in., its width 36 in., and its length is 87 in.

The Timken Roller Bearing Co. display included a new double roll, self-contained tapered roller bearing developed primarily for armature shafts of heavy-duty electric motors, such as are used on mine locomotives and similar places. This bearing provides the required float that is essential in certain types of electric motors. It has a considerably higher duty capacity than the single-roll type of bearing. It is assembled with a double tapered cone with two sets of rollers and cages having the same positive alignment feature as the conventional single-roll bearing. The outside races of the bearing are held in place by a fixed container, and the proper radial clearance is allowed in the initial assembly.

Edward C. Kirk & Sons, of Charleston, W. Va., exhibited a sand dryer of entirely new design. Cast integral with the outside walls of the fire pot are a number of heavy fins which add many square feet to the sand heating surface. Through the walls of the fire pot and dome are 16 vertical air channels with outlets to the stack, but arranged so that they

are not closed by the stack damper. Eight of these channels get their air supply through the grate, which is hollow, and the other 8 have numerous openings in contact with the sand. The idea of the design is to prevent burning of the grate and fire pot and to provide easy means for escape of moisture from the warm sand. At the bottom of the hopper is a movable ring, having pins which project a few inches up into the hopper. Moving the ring back and forth through a slight angle, by means of a lever, stirs the sand in the bottom of the hopper and opens any of the sand outlet holes which may have become clogged.

The same firm exhibited a pressed-steel terminal mold for use by coal companies that desire to make their own bonds of the type to be applied by the copper electrode process. There was also a double electrode holder for use in attaching the bonds.



Strain and Clamp

This shows the "Pullem" feeder wire strain and the "Tu-wire" trolley and feeder clamp. A common support for both feeder and trolley is becoming ever more and more popular.

The idea is to do the welding with less current and by using less of the copper electrode. The weld is started with the steel electrode and finished with the copper.

Heavy side-contact springs and renewable stationary washers are new features of a trolley harp exhibited by the Penn Machine Co. of Johnstown, Pa. A large swivel contact surface is claimed as another advantage of the design.

The Taylor Wharton Iron & Steel Co., High Bridge, New Jersey, exhibited for the first time their line of cast manganese steel frogs, mine car wheels, power shovel dipper teeth, conveyor chains, coal breaker segments, and rope sheaves.

At the booth of the American Mine Door Co. there was set up a working sample of the Canton Automatic Signal and Flag. With this system, the colored signal lights, indicating clear or blocked section of track are operated automatically

by the locomotive trolley wheels as they force the trolley wire up against pendant wires, which are suspended above the trolley wire, at certain locations.

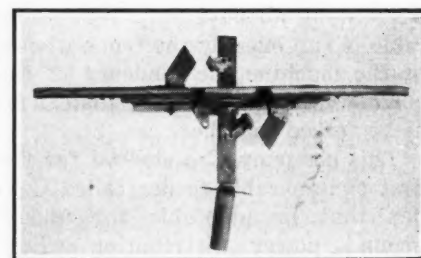
The heart of the system is an especially designed relay switch which actuates the lamp contacts upon impulse received as the locomotive passes certain points. This relay switch has coils designed to operate successfully over wide fluctuations of voltage.

Other new exhibits of the American Mine Door Co. were the Tu-Wire combined trolley and feeder clamp, and the Pullem clamp. The latter is a come-along clamp with strain insulator loops on each side. With this device, the feeder cable is anchored at any desired number of points without pulling the cable out of line with the trolley clamps.

A field coil tester, a double break section insulator switch and a trolley

harp, with contact springs were displayed by the Flood City Brass & Electric Co., of Johnstown, Pa., and by the Mosebach Electric & Supply Co., Pittsburgh, Pa., their agents. The section insulator has an extra heavy blade, renewable contact clips and holes for applying a lock.

The field coil tester provides a means of readily detecting one or more short-circuited turns in a series field coil. The trolley harp has con-



Section Insulating Switch

This switch is carefully made and of large carrying capacity. To this latter end the contacts are milled and made strictly interchangeable.

tact springs and renewable stationary contact washers, which shunt the current away from the trolley wheel bushing and axle.

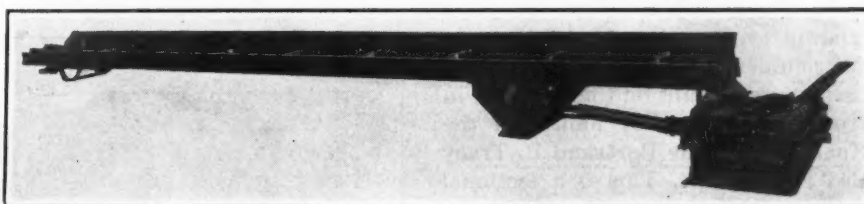
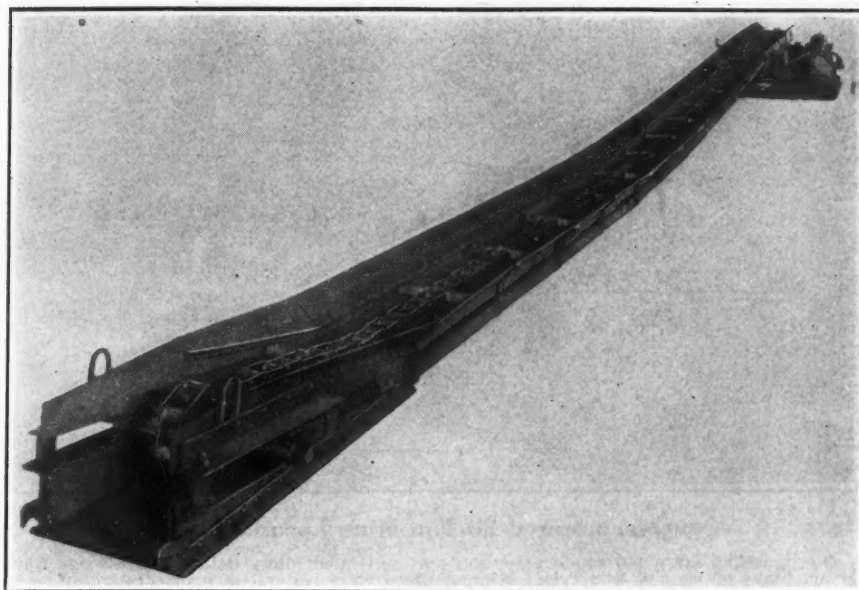
The Pennsylvania Crusher Co., of Philadelphia, showed a working model of a Pennsylvania steel frame Bradford breaker equipped with the new "Laclede" patented flat screen plate. The edges of the plate are so bent as to allow lap joints with a double row of attachment holes instead of the old type butt joint with one row of holes.

Four new items were in evidence at the exhibit of the Martindale Electric Co., Cleveland, Ohio. A commutator slotter weighing less than 20 lb. complete with motor, and selling for \$65, appealed to the electricians. This slotter has a $\frac{1}{4}$ in. diameter saw and therefore will cut within $\frac{1}{8}$ in. of the risers. The flexible shaft is 3 ft. long and the motor is mounted on a swivel base.

LITTLE BREAKER IS USEFUL

For use on portable drills and all small motor equipment, there was the Maple automatic circuit breaker, which is not much larger than a push-button switch and sells for \$3. These are made in capacities of 5, 10 and 15 amp., and can be used on voltages up to 250 direct current, or 440 alternating current. The overload device is adjustable through a wide range. The same company exhibited a commutator glazing stone which gives the commutator a chocolate colored glaze appearing like that which is natural after long brush wear and good commutation.

The Duff Mfg. Co., Pittsburgh, Pa., showed its new pinion puller. This consists of a special screw jack adapted to use with jaws of a size



Views of the Coalveyor

This is a trough with a single-strand conveyor chain running in its bottom. The lower cut shows how a cross or face conveyor can be joined to the main unit. The design is simple and the various parts so light that they can be easily moved from place to place.



Trolley Clamp

This is so designed that one man can string wire.

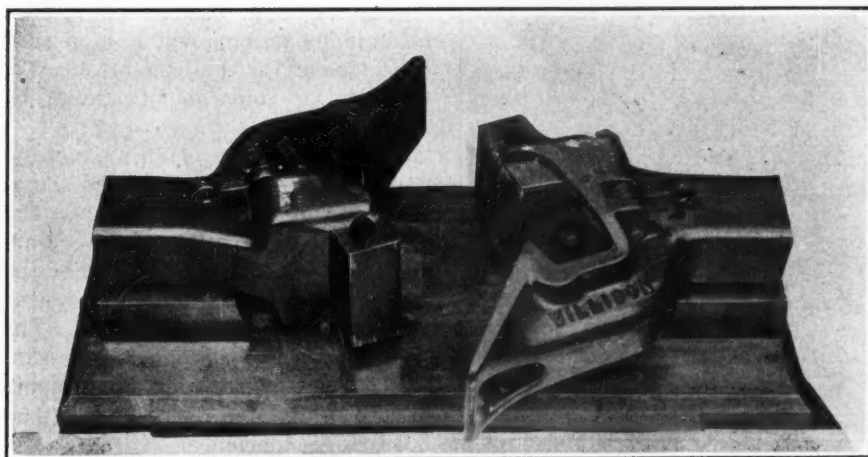
matic fly-ball friction governor that definitely controls the lowering speed.

The Handy rail clamp, a device for securely clamping the extension rail, in a balled position, to the permanent rail, was shown by the Cincinnati Steel Castings Co. The clamp is of cast alloy steel and is locked in position by wedging it with an ordinary rail spike.

The American Wood Impregnation Corp. of New York exhibited a piece of second growth pine that had been in use over ten years in a German mine. It had been impregnated with Wolman salts, and after the period of service mentioned, showed no decay. The salt is said to contain sodium fluoride, dinitrophenol and chromates.

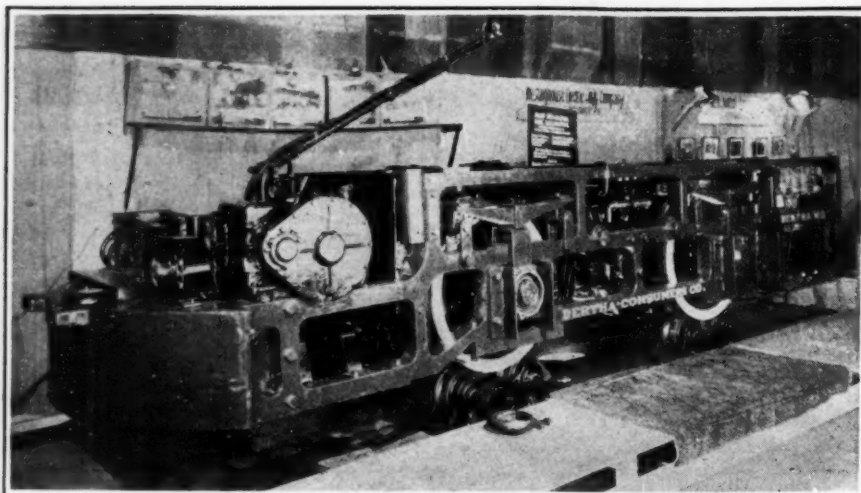
New ideas in automatic mine car couplers were not missing from the exposition. The National Malleable & Steel Castings Co., of Cleveland, demonstrated the Willison Coupler, which it is claimed will couple mine cars automatically on curves having a radius as short as 16 ft.

This coupler is more truly automatic than standard railroad car couplers because it is always in coupling position. Uncoupling can be affected by means of a lever ex-



Automatic Mine Car Couplers

The mining industry has long sought a satisfactory car coupler. Heretofore one of the greatest difficulties encountered was the fact that the curves used underground were so short that couplers of the railroad type would not operate successfully. A decidedly modified design was therefore necessary.



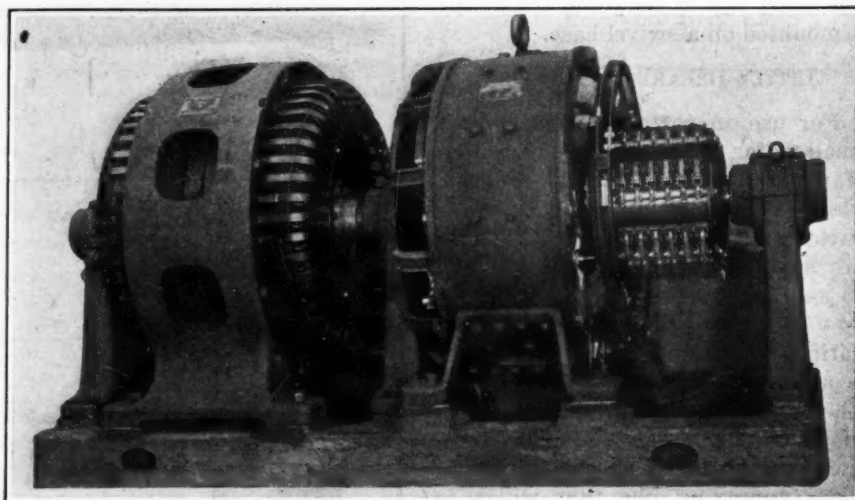
Overpowered 20-Ton Mine Locomotive

This machine attracted much attention and embodied many details not always found on machines of its size and type. Among these were roller bearings throughout, elliptical springs, air brakes, whistle and the like. Year by year the coal mines are adapting the successful practices of the railroads.

tending over to the side of the car.

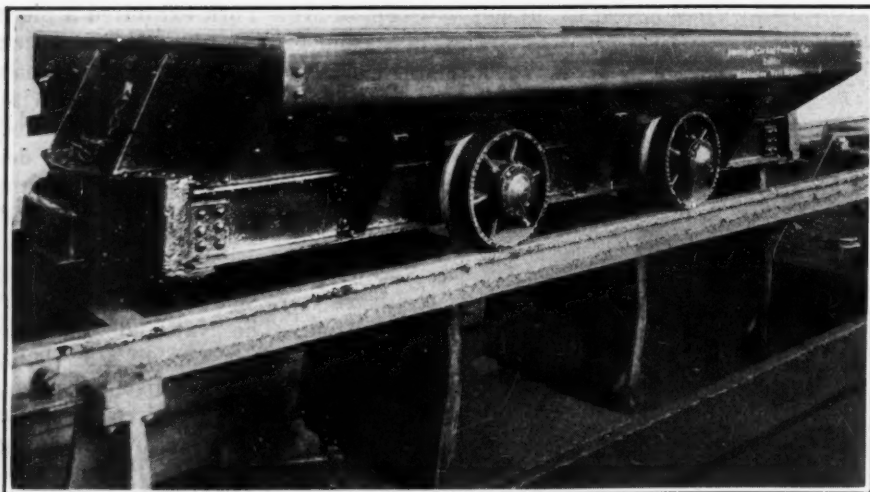
Prominently displayed in a temporary annex built on the sidewalk in front of the exhibit hall, was the Koalveyor, of the Bertrand P. Tracy Co., Pittsburgh. This is a sectional conveying system using a single-strand chain located in the center of the pan. The equipment consists of five units; power head with pan section attached, intermediate driving section, tail section, face conveyor, and standard pan.

An intermediate drive section can be inserted at any point in the conveyor for driving a lateral conveyor from power transmitted to a sprocket by the main conveyor chain. The tail-end section of the main conveyor likewise transmits power from the main chain to the face conveyor, thus eliminating a motor at the face.



Synchronous Motor-Generator Set Designed for Automatic Operation

This machine embodies a synchronous motor and a direct current generator. Nearly all possible contingencies have been guarded against and the chances of a shutdown because of accident to either machine are remote.



Drop-Bottom Car of Somewhat Unusual Design

This car embodies several unique features. It is claimed by the makers that although the frame has no bottom to stiffen it it cannot be warped out of shape by any ordinary usage. The top is rolled over instead of being fitted with an angle iron. This affords stiffness yet gives a comparatively smooth edge.

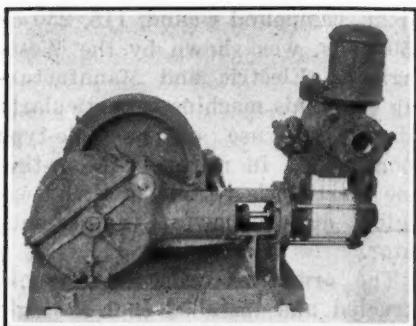
The Tracy company also showed a trolley clamp and cutter chain, both of new design. The clamp, which is called the Marvel, is of the self-aligning type which is designed for one-man wire hanging. The jaws are pulled open or clamped on the wire by a one-half turn of the top bell, which has a spiral groove in the bottom. The wrench stays on the bell while the man is inserting the trolley wire.

The cutter chain, known as the Cincinnati, is one without side straps. The flanges for preventing tipping of the bit blocks are on the blocks themselves, rather than on straps. Removable hardened steel bushings locked in the bit blocks join the blocks with the one-piece links. The object of the design is to provide a chain of low maintenance cost.

Even the humble coal scoop was being demonstrated at the exposition. A line of heat treated alloy steel bituminous scoops which is a new development for the Oliver Ames Co. was shown and demonstrated by severe bending tests.

Equipped with two 150-hp. motors, the new 20-ton Baldwin-Westinghouse haulage locomotive, for the Bertha-Consumers Coal Co., Burgettstown, Pa., and claimed to be the most powerful mine locomotive ever built, attracted much attention. The first of its type, this machine is said to incorporate the latest refinements of design dictated by results of past operating experience.

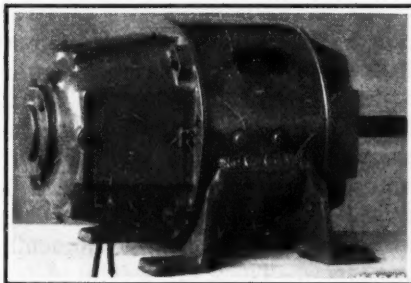
On an average grade of 1 per cent against the loaded trip, it is stated that this locomotive will haul 50 loaded cars, each having a capacity



Acid-Resisting Gathering Pump

This little pump is provided with a porcelain cylinder and a valve chest of either bronze or some other acid-resisting metal so that the deterioration caused from this source is reduced to a minimum.

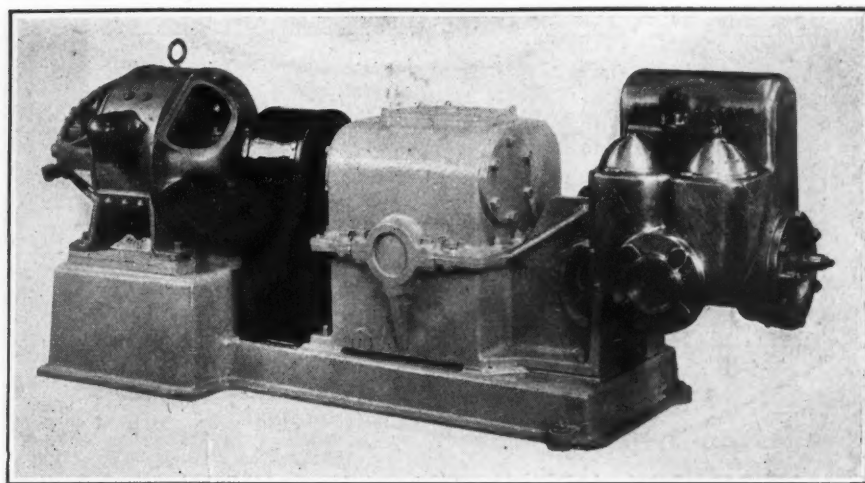
of 2½ tons, at a speed of 9 miles an hour. The usual trip will consist of 40 loaded cars hauled, at a speed of 10½ miles per hour, up an average grade of 0.9 per cent for a distance of 10,000 ft.



Permissible Motor

Motors that are expected to operate in gassy atmospheres are usually of small size. This little machine is designed to meet exactly this type of service.

Some of the features of the design of this locomotive are: Barsteel frame, electro-pneumatic control for series-parallel operation, air sanders, relay overload protection,



Austin Pump With Interposed Speed Reducer

In this unit the motor is backgeared to the pump by means of a worm speed reducer. Flood lubrication makes a minimum of attention necessary and because the materials used are of the best the upkeep is practically negligible.

leaf springs, use of through-bolts throughout, and Timken roller bearings for journal and armature bearings.

Automatic switching equipment for the control of a synchronous motor-generator set was also presented by the Westinghouse Electric & Manufacturing Co.

The synchronous motor receives power from an incoming line energized at 2,300 volts, three phase, 60 cycle. The direct-current generator is of the 40-deg. C. mining type, is compound wound, and delivers power at the standard mining pressure of 275 volts direct current. All equipment is full automatic after the remote or panel mounted push button has been operated. Switching operations are controlled through relays by system and machine conditions. The direct-current feeder

equipment is of the automatic service-restoring contactor type.

Protection is provided against troubles such as phase reversal, phase failure, low voltage, alternating-current overload and short cir-



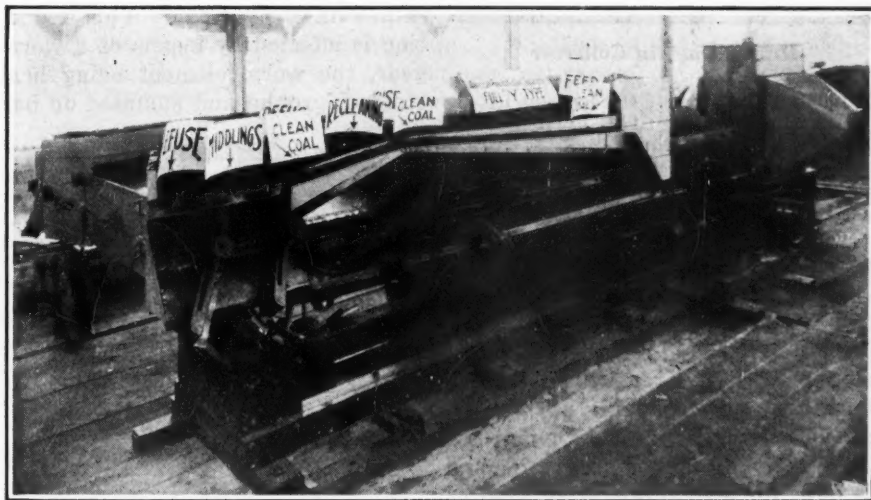
Hollow Drill Auger

This auger is intended for making shot holes to receive bombs loaded with liquid carbon dioxide. A core is cut which slips into the hollow barrel.

cuit, sustained overload, overheating of machine windings due to single-phase operation, overheating of the auto-transformer, failure to complete the starting sequence, failure of the synchronous motor field, direct-current overload and short circuit, direct-current reverse current, direct-current reverse polarity, overheating of the machine bearings, overspeed of the machine and restarting, until the speed and voltage of the machine have been reduced to a safe restarting value.

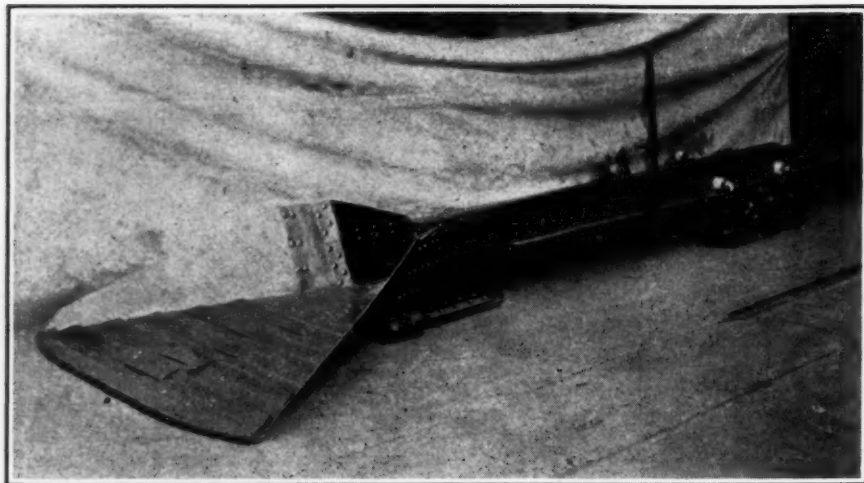
Much attention was also attracted by the all-steel drop-bottom mine car built by the American Car & Foundry Co. for the Red Jacket Consolidated Coal Co. The underframe of this car consists of pressed-steel gunwales and Z-shaped end sills securely fastened at the corners with angle irons and gussets. Over each axle the gunwales are tied together by ½-in. pressed-steel housings. The frame thus built up, it is claimed, cannot get out of square and will always allow a free movement and operation of the doors.

Floor and side sheets are made in



Improved American Air Cleaner

This machine was not shown in operation at the exposition. Its various parts were, however, labeled so that the observer could understand its workings. Dust is one of the big difficulties encountered in air cleaning, but it is claimed that this obstacle has been successfully overcome in this model.



The Jigger-Digger—An Alligator on Ball Bearings

The palate of the animal has a roughened surface, the ridges being of wedge shape with the thin edge forward. Thus all the coal the wedge passes under is dragged back when the conveyor is retracted.

one piece with pressed-in housings for the wheels. The top is rolled to afford stiffness and to avoid sharp edges. The car is fitted with a spring draft rig and cast-steel draw head at one end only. Heavy wood bumpers faced with steel plates are secured to the end sills. The drop doors are of $\frac{3}{4}$ -in. steel plates flanged on four sides to assure stiffness. The door mechanism consists of a cast-steel dog fastened to the end of a square shaft and a steel ratchet. All door parts are covered by housings that protect them from injury.

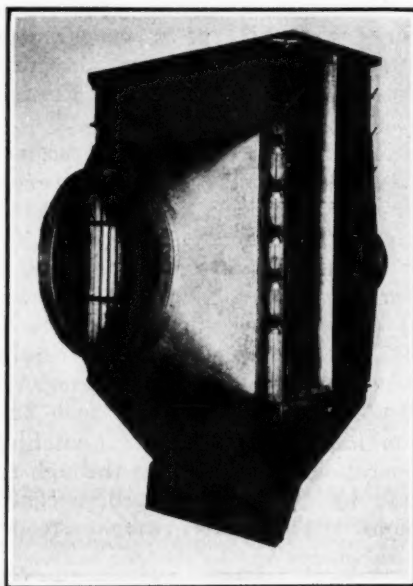
MAY BE USED INTERCHANGEABLY

This car is designed for maximum load with minimum height yet may be used interchangeably with other designs of the drop-bottom type without special tripping latches. Its construction and operating mechanism are patterned after those of a 70-ton hopper car and should afford equal reliability in service.

The Vitrox mine gathering pump shown by the Deming Co. of Salem, Ohio, is especially adapted to handling extremely acidulous mine water, the cylinder being a heavy tube of vitreous china which is immune from both the action of acid water and from electrolytic action. The inside of the cylinder is ground to a polished finish and, being extremely hard, offers exceptional resistance to abrasion and will outwear many standard bronze cylinder liners. It may be turned to any position desired so as to insure even wear throughout the inner surface.

The cylinder heads and valve chamber are separate castings of either cast iron, anti-acid bronze or chrome iron. The cylinder can also be fur-

nished of chrome iron instead of vitreous china if desired. The piston rod, piston and valve seats can



Draws Dust to Collector

Aspirator exhibited by American Coal Cleaning Corporation. Opening on left is connected with hood over table. Note louvers which regulate draft. Top opening is for $\frac{1}{2}$ -in. feed which is freed of dust by the aspirator and delivered at the lower opening. The air with dust is sucked through a port, the flange of which can be seen in the rear.

be furnished of anti-acid bronze or chrome iron and the valve springs of Monel metal.

The power end of this pump is equipped with renewable bronze bushings and all moving parts operate in a bath of oil. The pump has a capacity of 50 gal. per min. and is built for a total operating head of 170 ft., when equipped with a 5-hp. motor.

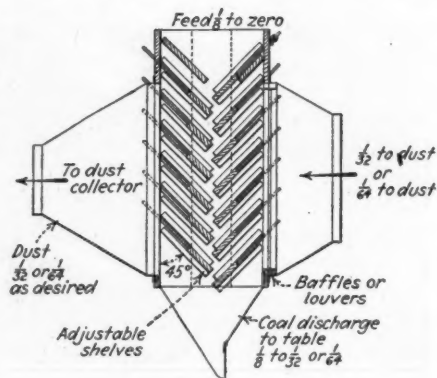
A new type RH, totally inclosed motor, rated at 5 hp., 15 minutes, 55 deg. C. temperature rise, 1,150

r.p.m., compound wound, 115, 230 or 550 volts, was shown by the Westinghouse Electric and Manufacturing Co. This machine is particularly adapted to use on portable-type room hoists in mines. Across-the-line starting is permitted with negligible disturbance at the commutator.

The armature coils are so constructed and installed that a single coil can be replaced with a minimum disturbance of the other coils. Each coil is specially insulated and the completed armature is thoroughly impregnated and baked, giving assurance of freedom from insulating troubles. The shunt and series coils for one pole are assembled as one unit and are dipped and baked in this form. Special precautions are taken to effectively insulate the coils from each other as well as from the ground.

The motor is rugged in construction, having a rolled-steel frame with feet welded to it. The bearings are of the heavy-duty roller type and the motor will operate in an inclined position. The inclosing covers are hinged to the bracket and can be raised for inspection of the brushes and commutator by simply loosening one screw. There are a total of four covers, giving good access to these parts.

A worm-gear driven Austin gathering pump was shown by the Dravo-Doyle Co., of Pittsburgh, Pa. This machine has an inclosed oil-tight reduction unit between the motor and the pump. The reduction ratio required for driving pumps of this kind varies from 20 to 1 for motors of 1,100 r.p.m. to 30 to 1 for machines of 1,750 r.p.m. This reduction is effected by means of a worm gear, the worm element being heat treated, ground and mounted on ball



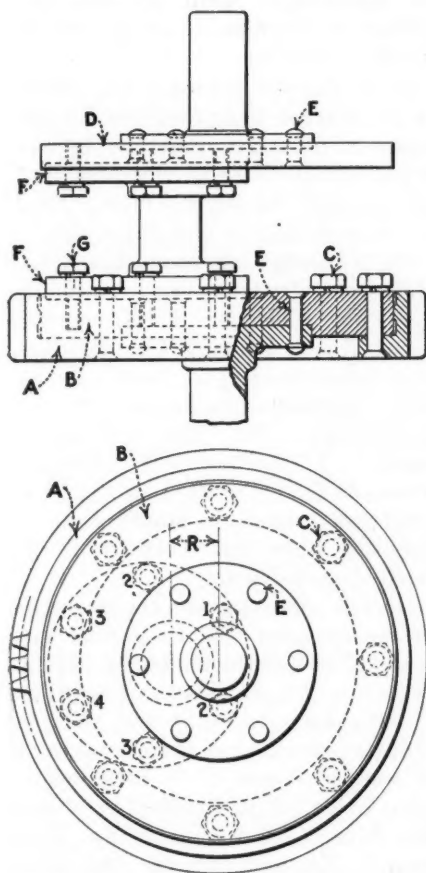
Cross-Section of Aspirator

The feed enters from the top and the dust from the table from the right. As the coal falls from shelf to shelf the dust is withdrawn from it and goes to the dust collector.

bearings. The transformation from the rotation of the worm wheel to the reciprocation of the pump piston is effected by means of a Scotch yoke that is guided top and bottom by long shoes.

All spur gearing is eliminated from the design, as well as all exposed moving parts. Operation in oil assures long life without attention, but the oil bath must be replenished about once a year. The extreme over-all width of this pump is only 25 in. This allows its installation in many places that would not accommodate a bigger machine.

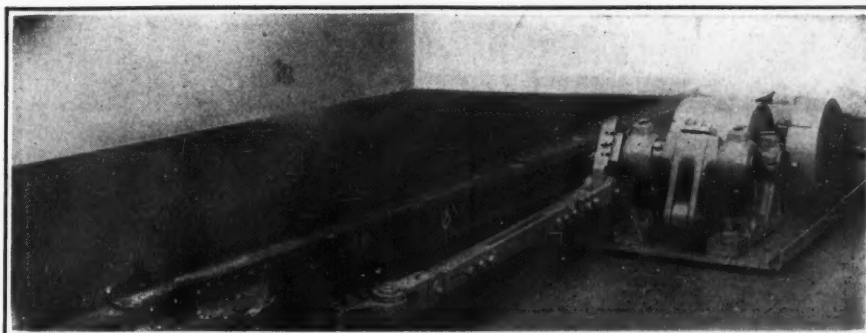
The Chicago Pneumatic Tool Co., of Chicago, Ill., had on exhibit the



Crank with Adjustable Throw

Four different reciprocations may be given the shaking trough. This permits the machine to be used under almost all operating conditions encountered underground. Simplicity and reliability are prime factors of the design.

specially designed core drill used in making the holes in the coal face for the accommodation of the carbon dioxide bomb recently described in *Coal Age*. Spiral ribs or feathers on the core barrel enable this drill to clear itself or push out of the hole the cuttings formed at the drill tip. The cutter head, as shown in the illustration, carries staggered removable teeth. The teeth themselves are in the form of six tool-steel pins



The Jigger Digger Shaking Engine

This machine gives the troughs the unequal reciprocation that conveys the coal. The length and violence of the shake is subject to adjustment so that varying conditions of operation may be met.

in each row, that may be removed and sharpened when necessary. The drill thus built up can be driven by one of the standard machines built by this company. Where this device has been used holes 3 $\frac{3}{4}$ in. in diameter and 6 ft. deep have been sunk at the rate of 1 ft. per minute.

The American Coal Cleaning Corp. showed a pneumatic separator of the full Y-type capable of cleaning 70 tons per hour of coal between 3 in. and 1 in., 50 tons per hour between 1 in. and $\frac{3}{4}$ in., 35 tons between $\frac{3}{4}$ in. and $\frac{1}{2}$ in., and 20 tons between $\frac{1}{2}$ in. and zero. The average table of this type will clean 30 tons per hour. There are eleven controls on each side which are operated externally and without stopping the movement of the table. A half-Y table is also made where large capacity is not desired. The corporation is no longer making the old types, which have too narrow a range of adaptability.

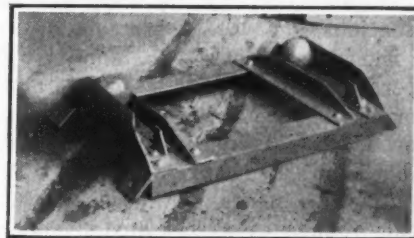
The same company showed an aspirator for freeing tables of dust. Its capacity is 25 tons of feed per hour. It collects about 5 tons of dust and delivers about 20 tons of dustless coal to the table and also withdraws from the surface of the table any dust that may be formed in the pneumatic separation or may have reached the table from the feed.

The aspirator is connected with the hood spread over the table, as shown on the right of the line drawing. It draws up dust through a passage in which louvers are interposed. By regulating the openings of these, the speed of the air is increased or decreased, and coal dust less than any desired diameter, such as, say, $\frac{1}{2}$ or $\frac{3}{4}$ in., is removed from the tables. Should, however, any dust of larger size be lifted, it falls on the shelves and is returned to the table. The $\frac{1}{2}$ -in. to zero coal in a bin

above the aspirator falls on the shelves and attempts to reach the table, but such coal as is between $\frac{1}{2}$ or $\frac{3}{4}$ in. and zero, as the case may be, is carried by the air to the dust collector.

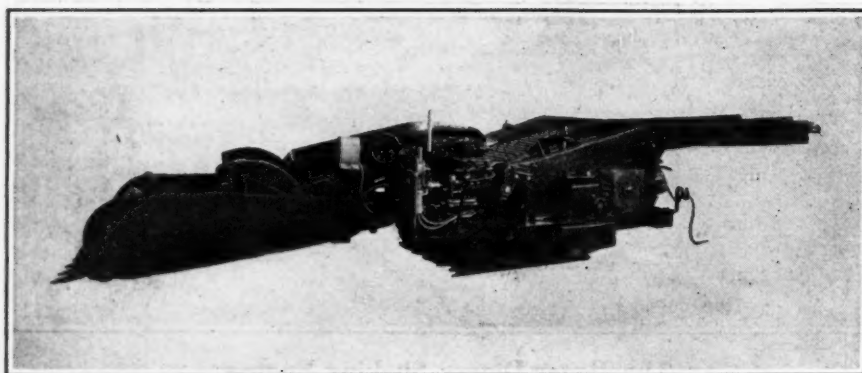
The advantage of this system is that the dust does not reach the tables, but is kept out of the plant, thus raising the efficiency of the separator. The dust from the dust collector can be, and sometimes is, removed by a worm to a pulverized-coal furnace. The quantity available for this purpose can be regulated by adjusting the size of the coal taken from the feed and table by the aspirator. If $\frac{1}{2}$ in. is taken, the quantity will be small and any increase in size will result in a larger supply of coal for fuel purposes.

The C. H. McCullough Engineering Co. presented its "Jigger Digger," an adjustment put on the end of a shaker conveyor trough to enable it to pick up coal from the floor and pass it back to another conveyor or direct to a mine car, as desired. The Jigger Digger consists of three parts: a pan fixed to a section of shaker conveyor and carrying the feed gear, another pan carrying a rack and sliding inside the former one, this pan being advanced by an automatic feed gear, which consists of pawls with double teeth guided between brackets fixed on the



Conveyor Ball Bearings

The jigger digger is hung on bearings of this kind. Such bearings do much to lessen the friction of operation and increase the efficiency of the machine.



Now Mine Shovels Are Permissible and Gasproof

The loading machine, like the coal cutter, travels around from place to place beyond the trolley wire and for years there has been a call for permissible equipment. The illustration shows a Myers-Whaley shovel thus equipped.

lower pan and held in position against the rack by springs.

The pawls can be disengaged by the movement of a lever, and the upper pan is then free to move forward at every "shake" of the conveyor. The extent of the forward movement can be controlled by the operation of the lever. The digging end is hopper-shaped, the wide end being kept toward the coal to be shoveled. On the upper face of the bottom of the digging end are wedge-shaped slats that pass under the coal and hold it from returning to the coal pile, but do not resist its motion away from the coal face.

Among new developments is the adjustable crank which is intended for use on moderate or steep grades where small conveying effort is sufficient. Shortening the radius of the crank circle gives a motion which is claimed to be better suited to steep gradients than that which is obtained by shortening the stroke of the driving arm.

Four positions of the crank are available according as the disks are turned through 0, 60, 120 or 180 deg. Position 4 should be used on a level or on low gradients. Position 3 is nearly the same as position 4. Position 2 should be used on grades of 12½ to 20 per cent. The shortest throw of all, obtained in position 1, is suitable only to the steepest inclinations, such as 33 per cent.

The Myers-Whaley Co., showed in operation its explosion-proof and permissible loading shovel, and the Joy Manufacturing Co. its permissible loading equipment. The U. S. Bureau of Mines exhibited a two-scale replica of a rock-dusted entry with undusted face from which the coal had been shot down. It also exhibited a number of appliances for gas detection and determination and for mine-rescue work.

The National Carbon Co. exhibited a permissible electric flash-light and permissible blasting unit, the latter being designed on the same basis as the former. The flashlight not only has the approval of the U. S. Bureau of Mines, but also of the Underwriters' Laboratories. The flashlight has a small bulb in its head. This, a spring ejector constantly



Mechanism for Advancing Receiving Head of Jigger-Digger

By the throwing of a lever, pawls are disengaged and the upper pan is then free to move forward fast or slow at every "shake" of the conveyor.

endeavors to force out of contact with the leads from the battery. This action is arrested by a guard which prevents the ejector from operating until and unless the lamp glass is shattered, in which event the circuit would open instantly, and the filament would be extinguished. The flash-light has a range of 300 ft. and can be focussed for any distance desired by a turn of the cover on the base. A safety lock switch is so arranged that either a flash or constant light can be maintained. The flash-light has a ring handle for attachment to the belt if desired. Within the screw base cover mentioned is an additional bulb for emergency use in case the bulb in the lamp head fails or is broken. The bulb can be inserted, it is said, even in the presence of firedamp, without ignition of methane.

Banquet and Luncheons Facilitate Business

On Wednesday, the Mining and Loading Committee held a luncheon to receive and discuss the report of G. B. Southward, copies of which were presented to the committee members for their examination and consideration. L. E. Young was in the chair. Though the sentiment was favorable, it was decided to leave the matter on the table till the following day when another luncheon was held at which the report was accepted, and Mr. Southward was requested to continue his investigations in the bituminous area East of the Mississippi until all the important mechanical-loading points had been covered.

V. E. Carroll occupied the chair. As Mr. Carroll is no longer a mining engineer in active practice, he resigned, and J. D. Zook, vice-president and general manager, O'Gara Coal Co., was elected as vice-chairman.

On Thursday at noon, the Manufacturers Division met at luncheon and re-elected H. K. Porter, Hyatt Roller Bearing Co., Newark, N. J., chairman; H. A. Buzby, president, Keystone Lubricating Co., Philadelphia, Pa., first vice-chairman; C. L. Herbster, Hockensmith Wheel & Mine Car Co., second vice-chairman; and F. J. Maple, John A. Roebling Sons Co., Trenton, N. J., third vice-chairman.

On Thursday evening, the Manufacturing Division held its annual banquet. Ezra Van Horn introduced H. K. Porter as toastmaster, who in his opening remarks, said that the coal industry would have better success if it was possessed of a little wholesome pride. J. R. Bradley, president, Elk River Coal & Lumber Co., Dundon, W. Va., said that the coal industry should take a leaf out of the Southern book of progress where the coal industry was a unit in presenting its case for public approval and support. He warned the bituminous coal industry that the oil-fired furnace threatened not only the anthracite fields, but the soft-coal regions, also. Ingenuity must devise a way of getting the ashes out of the back door without the person doing it being detected in the act, or else the oil burner will oust the coal burner. No one will say he cannot afford to burn oil in these days of extravagance.

Noah Swayne, of Philadelphia, made a humorous address and was followed by J. F. Callbreath. A dance concluded the entertainment.



News Of the Industry



Central Pennsylvania Coal Operators And Miners Open Peace Negotiations At Philadelphia in Hopeful Attitude

By Sydney A. Hale

Associate Editor, Coal Age

(By Wire from Philadelphia)

Philadelphia, Pa., May 24.—Central Pennsylvania union operators and miners started negotiations for a new wage agreement at the Bellevue-Stratford Hotel here yesterday afternoon. Owing to the absence of Thomas Kennedy, international secretary-treasurer of the United Mine Workers, who did not reach Philadelphia until late this afternoon, the conferences have not as yet passed beyond the organization stage.

The parties to the conference are the Association of Bituminous Coal Producers of Central Pennsylvania and district 2 of the union. At the meeting yesterday J. W. Searles, president, Pennsylvania Coal & Coke Corporation, was elected permanent chairman of the conference, and W. A. Jones, statistician for the operators, and Richard Gilbert, secretary of the district union, were chosen secretaries.

The operators' scale committee is headed by Rembrandt Peale, president of Peale, Peacock & Kerr, Inc., and a member of the Bituminous Coal Commission of 1920 which fixed the basic rates, other than the day scale, now being paid in the union fields. James Mark, recently elected president of district 2 to succeed John Brophy, heads the miners' scale committee. Charles O'Neill, president of the operators' association and secretary of the Central Pennsylvania Coal Producers' Association, and Mr. Mark have been authorized to act as a publicity committee for the conference.

Action Awaits Kennedy

With these preliminaries of organization out of the way, it is expected that a real attack upon the issues before the conference will be made tomorrow or Thursday. The conference held a short session yesterday afternoon, met again this morning only to adjourn because of the absence of Mr. Kennedy, and held another short session this afternoon.

How long the conference will last or what the results will be are subjects upon which neither side will venture any public expression of opinion. The atmosphere at the opening of the negotiations, however, was much more hope-

ful than that surrounding the start of the unsuccessful meetings between Central Competitive Field operators and miners at Miami last February or the conference between the shaft producers and district 11 at Terre Haute early this month.

That the union considers the present meetings among the most important since the wage controversy arose is indicated by the presence of Mr. Kennedy and the unwillingness of district 2 officials to proceed with the negotiations until he was on the scene. No international official, on the other hand, participated in the Terre Haute conference.

Field Is Important to Union

Except for the Southwest, the present conference represents the first move for negotiations in any of the so-called outlying districts. Although the union has lost considerable ground in central Pennsylvania since the 1922 strike, this region, nevertheless, is the only field east of the Central Competitive states in which any recognition is extended the Indianapolis organization.

At present the union operations in this field are working under the terms of the interim proposal made to the outlying districts when the international policy committee of the union held its meeting in Miami following the adjournment of the Central Competitive Field joint interstate conferences. Central Pennsylvania operators accepted the proposal to continue at work on the old scale pending the negotiation of a new agreement with the distinct understanding that individual producers retained full freedom of action to withdraw from participation in the interim agreement at any time they might elect.

While the union operations in this field have been forced to meet the competition of mines in the same area paying lower wages, they have not made public any specific demands for relief to be presented to the miners in the joint conference. The operators held a separate meeting yesterday morning and decided to leave questions of policy in the hands of the executive committee of their association.

Urges Advisory Powers For Trade Commission

Revision of the Federal Trade Commission Act to give the Commission authority to pass on certain practices in an advisory way, was recommended recently by Chairman C. W. Hunt, in an address before the American Wholesale Grocers' Association.

"The Commission should have power," said Mr. Hunt, "to pass on certain classes of practices in an advisory way to the end that the legality may be determined without first subjecting earnest, law-abiding citizens to a charge of law violation. The weakness of the Commission is not that it possesses or exerts too much authority but in many respects its authority is inadequate."

On both sides, of course, there are a number of working conditions which have been bones of contention for years. The question of car pushing, for example, crops up in every wage negotiation. On the whole, however, there is less complaint that conditions press unfairly upon the employers than in some of the districts farther west. It is not unlikely, therefore, that basic rates and, possibly, some reclassification of workers will loom large in the present negotiations.

In view of the manner in which the miners co-operated with the producers in seeking a more favorable adjustment of freight rates from the Central Pennsylvania Field, operators are hopeful that the miners are coming into the conference with a real appreciation of the difficulties under which the mine owners are laboring and that an opportunity will develop for the negotiation of a new agreement which will be really constructive.

No Progress in Pittsburgh Region

There has been no change in the labor situation in western Pennsylvania. Production of the Pittsburgh Coal Co. for the week ended May 14 was reported as 115,246 tons, against 116,928 tons the first week of the month. The average number of men at work was 5,226. The output of the other open-shop mines in the district is estimated to run between 25 and 50 per cent of the production of the Pittsburgh Coal Co.

Another chapter in the legal squabble over the eviction of men from the Coverdale property of the Pittsburgh

Terminal Coal Corporation was written last week when Judge James R. Macfarlane of the Court of Common Pleas issued a rule ordering the union to show cause why bonds filed on the appeals of eight cases to the Superior Court should not be set aside. Argument on the ruling will be heard next month. The motion to set aside the bonds in three earlier cases was denied by Judge Macfarlane.

Frequent meetings of miners' locals continue to be held throughout the eastern Ohio district and officers of district 6 of the United Mine Workers are occasionally present to explain the situation and answer questions. Dissatisfaction of the miners is reported to be increasing but the information naturally is indefinite and diverse in its sources.

In some places the treasuries of the locals have been opened and strike benefits paid to men most in need. Men who own real estate or automobiles are excluded from these benefits, and this in turn causes some dissatisfaction. At a meeting in Neffs last week a questioner demanded of Lee Hall, president of the Ohio district, why he charged \$1.50 for a meal on his expense account when the strikers were only spending 3 and 4c. for a meal.

Following a mass meeting in Bellaire a few miners expressed the opinion privately that if an agreement could be reached at a somewhat lower scale the men would return to work.

Directors of the Ohio Coal Operators' Association, Inc., will meet in Columbus, today to canvass the situation in Ohio and possibly decide upon a recommendation to the membership.

The Trumbull-Humphrey Coal Co., owner of a small mine near Shawnee, Ohio, announces that it has signed the union scale and has reopened its mine, giving employment to 15 men.

Quiet prevails in the suspension area of Illinois and Indiana. No new mines have resumed operation under the union terms in Illinois. It is believed due largely to poor market conditions. There is no demand for coal and prices in western Kentucky are off 15 to 25c. from a week or ten days ago. Western Kentucky mine-run and screenings are freely offered at \$1.25 to \$1.40. Union mines operating in Indiana and Illinois are having a difficult time in disposing of their daily outputs. In a few cases running time has had to be curtailed.

Illinois Operators Formulate Terms

It is understood that the Illinois operators have decided on what they will ask from the union whenever the two sides get into a joint conference. The demands are carefully guarded but it is believed they provide for a lower production cost and a modification of the working agreement giving operators more control over their employees.

That some miners in Illinois already are feeling the pinch is indicated by a recent move of the union to guarantee local merchants the payment of bills incurred by miners out of work. Local unions are reported to have informed some storekeepers, that the organization would stand back of the merchants who extend credit to union members. In order to protect the organization, the union has asked some

Cutting Wages and Laying Off Workers Branded As False Economy by Secretary Davis

Cutting wages and laying off workers as a means of offsetting business depression are vigorously opposed as specious methods by Secretary of Labor James J. Davis in an article written for the Policyholders' Service Bureau of the Metropolitan Life Insurance Company.

In explaining ways of maintaining unwavering and permanent prosperity Mr. Davis asserts that panics are avoidable and can be forestalled, to a great extent, by stabilizing payrolls.

"One factor that, in my estimation, would contribute to this much desired end," says Secretary Davis, "is general realization on the part of employers that the stability of prosperity depends on the stability of the payroll. We have in this country nearly 25,000,000 actual wage earners. With those engaged in clerical and similar work, we have more than 31,000,000 people at work on salary or wages. Including all others gainfully employed, we have a grand total of 41,500,000

people who live by what they earn.

"When this army is steadily employed at liberal wages, we have in circulation an enormous amount of buying money. These people are the great consumers. They are the nation's biggest customer. And the business men of the country have it within their power to keep this big customer in position to go on consuming and buying. The simple way is by keeping wages stable.

"The old method of meeting lessened business conditions was either to reduce wages or to lay off men. This, in my opinion, is not the modern scientific method. I am absolutely convinced that the old method of lowering the wages or laying off men is not the cure for business depression, but only increases depression.

"The new way is not to reduce employment or wages, and so reduce buying power and spirit. The new way is to stimulate sales, to create new markets, by the modern scientific methods now available."

of the southern Illinois operators to accept assignments of future wages.

Another break in association ranks in Indiana is claimed by the union. According to Harvey Cartwright, president of district 11, the Dresser mine of Walter Bledsoe & Co. has signed up and probably will begin operations this week. The Dresser shaft is located at Macksville. The mine normally employs 120 men and has a daily output of 800 tons. It is the sixth shaft mine to open since the strike.

Judge J. A. Cooley in the Circuit Court at Kirksville, Mo., has issued a temporary injunction restraining United Mine Workers' local union 1220 from picketing the mine of the Kansas City Coal & Mining Co. at Novinger, Mo. The company recently announced that it would operate the mine under the 1917 scale. When local miners refused to accept work at the mine on that basis coal diggers were brought in from Oklahoma.

Although little has appeared with respect to conditions in the non-union fields, private investigators report that definite areas of dissatisfaction are developing and that under-cover men for the union have been active in a number of districts. Even the Winding Gulf field, it is said, is not immune and there are rumors of strike threats in western Kentucky, particularly in the neighborhood of Madisonville. Organizers have been working openly in eastern Kentucky.

Sealed proposals will be opened by the Superintendent of Lighthouses, 37 Marginal St., Chelsea, Mass., at 2 p.m., June 3, 1927, for furnishing 4,000 tons of bituminous coal at New Bedford, Mass. Additional information will be furnished upon application.

Explosives Consumption Heavy at Coal Mines

Of the 1,536,517 kegs (25 lb. each) of black blasting powder used in all of the industries of the United States during the first quarter of 1927, 1,370,671 kegs were used in coal mines; 64,348,521 lb. of high explosives, other than permissible, were used, and of this 8,205,944 lb. were used in coal mines. Coal mines also used 16,334,948 lb. of the 17,004,218 lb. of permissible explosives reported to have been consumed during this first quarter.

Taking into consideration the number of non-reporting companies, the Bureau of Mines estimates 90.52 per cent of the black blasting powder, 25.1 per cent of the high explosives, other than permissibles, and 74.01 per cent of the permissible explosives used in coal mines to have been used in bituminous operations.

Record Freight Movement Handled in March

Class 1 railroads of the United States in March, 1927, handled the largest volume of freight traffic ever placed with them in that month, according to the Bureau of Railway Economics. The volume aggregated 41,816,180,000 net ton miles, an increase of 2,218,535,000 net ton miles, or 5.6 per cent above the best previous record of March, 1923.

For the first three months of 1927 these roads carried traffic aggregating 118,293,890,000 net ton miles, the greatest ever reported for any first quarter, and an increase of 6,544,591,000 net ton miles, or 5.9 per cent, over the best previous record, which was in the first quarter last year.

Recommendations to Renew Europe's Economic Health Formally Approved In Resolutions at Geneva Conference

By E. J. Mehren

Vice-President and Editorial Director, McGraw-Hill Publishing Co.

(By Cable from Geneva)

GENEVA, SWITZERLAND, May 21.—The recommendations of the Economic Conference for restoring the economic health of the world, particularly that of Europe, all of which had been approved by the committees, were given final approval in the general session of Tuesday, May 17. The resolutions on industry cover rationalization, industrial pools and statistics. (Rationalization is the general term employed to cover standardization, simplification, the use of more machinery, the application of scientific management and the consolidation of industries.)

The recommendation on rationalization urged that labor should co-operate to obtain good working conditions and a fair share in the results. It also advised occupational selection, guidance and training for labor. There was further recommended a national and international standardization program for materials, parts and products to facilitate international trade. The education of manufacturers' workers regarding the advantages of rationalization also was urged.

Disagreement was quite general with regard to national and international industrial pools. They were believed to be good or bad according to results and their regard for the general interest. Their field of application is limited to branches of production already centralized and to products in bulk or of recognized grades so that cartels alone are not able to remove European troubles. Where they are applicable, however, they secure more methodical organization of production, reduce costs through better utilization of existing equipment and develop new plants along better lines.

Group Action Aids Stability

Such group undertakings more rationally check uneconomic competition, reduce evils of fluctuating industrial activity and thus assure greater stability of employment. They also reduce production and distribution costs, making for lower selling prices and thus benefit the consumer. However, if pools encourage monopolistic tendencies and the application of unsound business methods they may check technical progress and incorporate dangers for the public. If pools are resorted to, they must not injure either the consumers or the workers nor restrict the supply of raw materials or basic products to any particular country. Neither should they create unequal conditions between the finishing industries of consuming and producing countries.

The control of national agreements by an international judicial scheme is impossible. However, national legislation can control the operations of an international agreement in home territories, although voluntary recourse to

arbitral bodies is desirable. The League of Nations should study international industrial co-operations and their effects upon technical progress, production and labor prices and should publish such data. Such publicity would form an effective means for obtaining public approval and for preventing abuses.

In connection with industrial statistics, the conference recommended that international statistics be compiled on the supply of raw materials, on output, stocks, prices, wages and employment. It recommended a standardization of terms, methods and scope to begin with the basic world industries and those raw materials in which world shortage is anticipated. A continuation of the League's review of changes in world production and trade also was recommended.

The resolutions on commerce were very long and deserving of careful study by all interested in foreign trade. They condemn export and import prohibitions and special privileges granted to state enterprises. The conference recommended a liberal policy toward

foreign nationals and companies engaged in commerce and urged a simplification of customs and tariffs and a standard nomenclature.

The stabilization of tariffs by means of long term treaties, referring chiefly to European countries, also was recommended. It was declared that hampering tariffs should be reduced, starting with those imposed to counteract the effects of war disturbances. It was recommended that the exportation of raw materials be not burdened by export duties and that such duties, where necessary, should not discriminate between different countries. Commercial treaties should contain an unconditional most-favored nation clause in the broadest and most liberal form. A uniform interpretation of said clause was urged.

Subsidies Disapproved

All direct and indirect subsidies to home industries were condemned and dumping was declared harmful and out of all proportion to any temporary advantage from cheap imports.

The agricultural recommendations were based on the fact that agriculture is the occupation of a majority of the world's workers and that maximum industrial development is determined by the quantity of food and raw material which they produce. It was declared that an equilibrium must be re-established between the returns to industry and agriculture. Low farm purchasing power has reduced the demand for industrial products and the

Hammond Urges Research Laboratories to Study Business, Political and Social Problems

Declaring that we are in "the pick-and-shovel stage" in dealing with economic problems, John Hays Hammond, noted engineer, advocated the establishment of great research laboratories for the study of business, political and social matters, in a recent address at Philadelphia. He was the guest of honor at a dinner in celebration of the forty-sixth anniversary of the Wharton School of Finance of the University of Pennsylvania.

The systematic and continuous application of the method of the engineer to the economic and social field, said Mr. Hammond, was the greatest problem of the present day, and he pointed out that while huge sums were spent in the development of industry, government, scientific research laboratories and astronomy, "popgun" methods were still used in the study of economic problems.

"We must recognize that fragments of time of single individuals working alone will no more be adequate to meet our national need today than were the part-time efforts of overloaded teachers in 1873 adequate to meet our great need for the development of facts and laws of physics and chemistry.

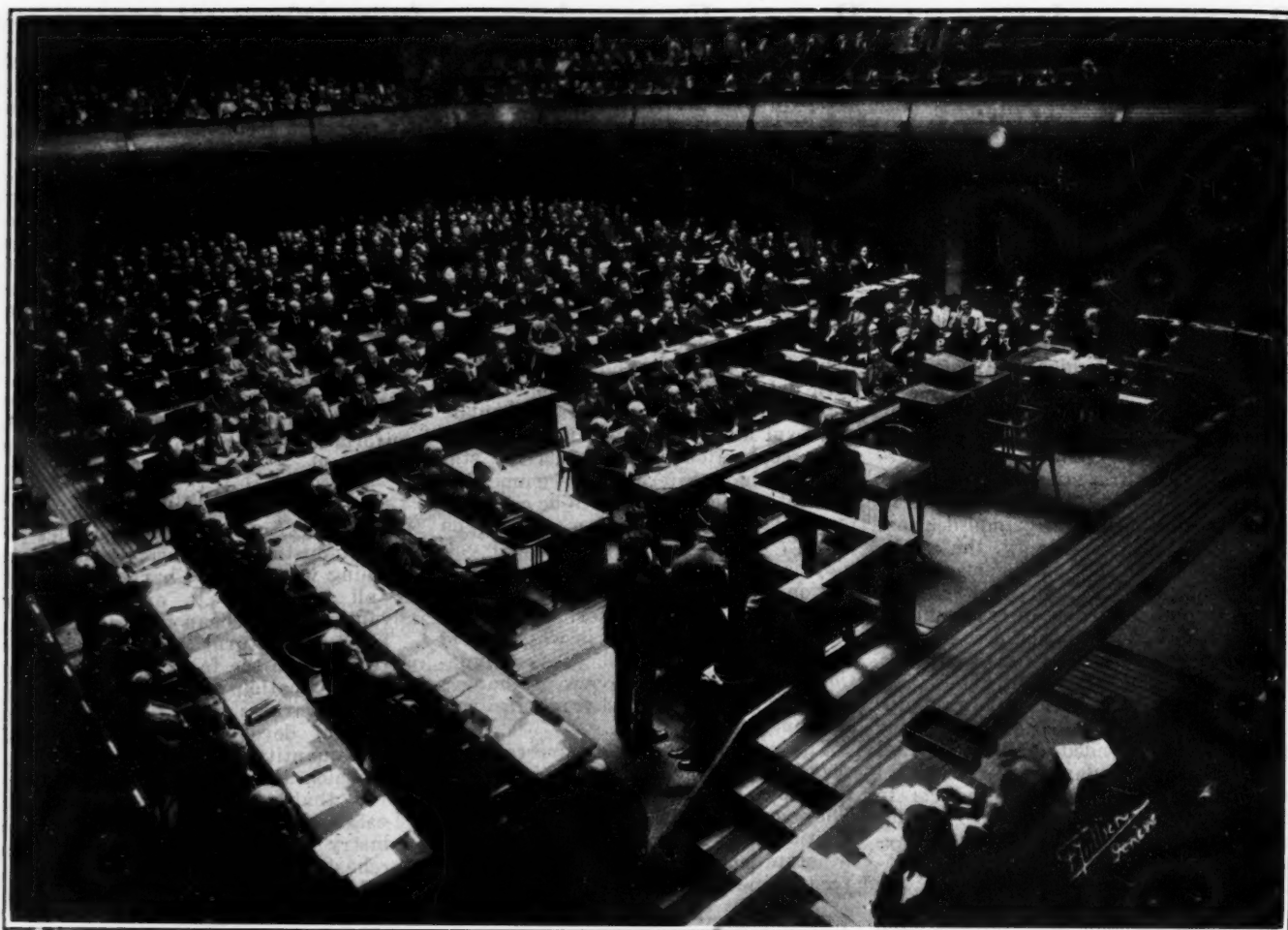
"We need facts, and yet more facts; then our opinions will have

some foundation. In view of the number and magnitude of our problems and the number and complexity of our facts, we need to equip ourselves as definitely for research for facts in these fields as in the last fifty years we have in the fields of the physical sciences. We need great research laboratories for the organized and continuous study of problems of business and political and social life if we are to 'catch up.'"

Mr. Hammond cited war debts, international relations, agricultural unrest, labor relations, prohibition and "defilement of our political institutions" as some of the problems for solution by the economist.

"The way we meet our problem of labor relations," he said, "will decide whether we can solve the human problems of working together or whether, we, too, are headed for the vicious cycle of class consciousness which engulfs so much of Europe."

Mr. Hammond suggested that the University of Pennsylvania take the lead in the establishment of a great bureau of economics similar to the federal Bureau of Standards. Such a bureau, he said, would not function freely under political auspices.



Opening Session of International Economic Conference at Geneva, Switzerland

fear was expressed that unless a balance is restored decreased agricultural production will be detrimental. Welfare-making remedies suggested are a general adoption of a scientific organization of production, technical improvement and marketing, standardization of agricultural products and better credit systems—all tending to reduce the cost of production.

Because American public opinion is opposed both to governmental participation in industry and to monopolistic tendencies, American delegates stated that while not opposed to resolutions on industrial pools they would abstain from voting thereon. There was no criticism or animosity to America and no evidence of a European combine against America. The contribution of American delegates was much appreciated, for they took the position that they were here to help give the data requested regarding our experiences but not to tell Europe what to do.

The joint committee on coal classification working under the auspices of the American Society for Testing Materials will hold its first meeting at the Benjamin Franklin Hotel, Philadelphia, Pa., on June 10. Arthur Kuppinger, president, Seaboard Fuel Corporation, will represent the American Wholesale Coal Association to the end that merchandising practice as well as engineering standards may receive appropriate consideration.

Loree Files New Brief For B. R. & P. Lease

Closely following the refusal of the Interstate Commerce Commission to approve the creation of a Southwestern rail merger by the unification of the Missouri-Kansas-Texas R.R., the St. Louis Southwestern Ry. and the Kansas City Southern Ry. proposed by president L. F. Loree of the Delaware & Hudson R.R., Mr. Loree made a new

attempt to convince the Commission last week of the desirability in the public interest of linking up the Delaware & Hudson and the Buffalo, Rochester & Pittsburgh as a part of an Eastern system.

A brief was filed with the Commission May 20 by Charles Evans Hughes for the Delaware & Hudson, setting forth that grouping of the Buffalo, Rochester & Pittsburgh with the Delaware & Hudson by means of trackage rights over the Pennsylvania R.R. from Button to Dubois, Pa., "will create a new and efficient transportation unit resulting in real undoubted and substantial public gain."

The terms for the lease on Buffalo, Rochester & Pittsburgh, the application stated, have been approved by the respective boards, and if the Interstate Commerce Commission approves the plan, the B. R. & P. will renew the option which it canceled in February.

Stress was placed upon the assertion that secure provision will be made by approval of the lease for replacing with bituminous coal the anthracite now furnished from mines on the Delaware & Hudson as the anthracite supply is depleted.

Under the proposed arrangement Mr. Hughes concluded "existing transportation facilities will be utilized more nearly to their full capacity."

The New York Central and Baltimore & Ohio, interveners against the plan, will be allowed ten days in which to file an answer to the D. & H. brief.

Fight on Hard-Coal Tax Goes to Supreme Court

The State of Pennsylvania has filed a motion in the U. S. Supreme Court at Washington for a hearing next fall of the Hudson Coal Co.'s attack on the Pennsylvania anthracite tax. Unpaid taxes of \$3,860,000 and \$985,000 now due for the year 1926 are involved in the case, as the companies have refused to accept a previous decision of the Supreme Court of Pennsylvania holding the hard-coal tax legal, the state has informed the court.

The previous decision held that anthracite differs from bituminous sufficiently to justify the tax levied on the former and not on the latter.

Smith's Comments on Rate Structure Fraught with Deep Significance in View Of Forthcoming Lake Cargo Decision

By Paul Wooton

Washington Correspondent of Coal Age

In view of the forthcoming decisions of the Interstate Commerce Commission in the Lake cargo case and in the general investigation of east-bound coal rates, significance is attached, by certain officials in Washington, to the address of Dr. George Otis Smith, Director of the U. S. Geological Survey, at the recent Chicago convention of the International Railway Fuel Association. His remarks about "unnecessary hauling," the "logical short haul," the "unnecessary long haul" and waste of transportation are the subject of much comment just at this time when the coal industry is awaiting the action of the Interstate Commerce Commission in cases which are certain to have far-reaching efforts.

Dr. Smith is a prominent federal official. He is acknowledged as an authority on coal. He was a member of the late U. S. Coal Commission. There can be no misunderstanding of his position as he declares that "a study of the rate structure as applied to Lake cargo coal would interest a commercial geographer who thinks in terms of distance to market. For the southeastern Kentucky coal fields, for instance, the mileage to Lake ports is more than two and one-half times that of the Pittsburgh field, yet the rates are less than one-seventh higher. Work this out in ton-miles and he would discover some bargains in transportation, since for the excess ton miles in the long haul, the rate is about 10 ton miles for 1c., although the Pittsburgh coal pays nearly 1c. a ton mile.

Cut Distance with Low Rates

"The geographer might work out this relationship of cheap long hauls on the map by moving a southeastern Kentucky coal field up into Ohio. Of course, nature didn't do that and so it happens that operators of Ohio and Pennsylvania mines have been for years asking why should the railroads attempt to wipe out distance with below-cost freight rates."

In the protests emanating from Southern fields and in the way in which the press has seized upon "what price distance," "It is ton miles that count" and other epigrams which Dr. Smith employed in his speech, an indication is had of the liveness of the subject.

At one point in his speech Dr. Smith described a "glaring illustration of waste of transportation" as follows:

EDITOR'S NOTE.—The foregoing Washington letter reflects certain views of official Washington. Due to the fact that policy as a rule prevents government officials from permitting their views being quoted directly, the authority for these reports is necessarily somewhat vaguely referred to. The views reflected are not those of any one group of officials, but of different men, in the legislative and executive departments. There is no necessary connection between their views and COAL AGE editorial policy; neither do they necessarily represent Mr. Wooton's personal views.

"The desire of land owners for development started the shift of mining activities from north to south of the Ohio River. This untimely development involved a rapidly increasing production uninvited by market demand and unwarranted by any consumption in sight. The consequent need of Southern operators for Northern markets was met in part by differences in the cost of labor and other items in production and in part by freight differentials. The long haul from Southern mines, not justified by market requirements, was made possible only by freight rates that were relatively low compared with those for the competing mines nearer the markets. Competition for markets which disregard distance violates natural law even though it may conform to the man-made Sherman and Clayton acts. The short haul is an economic blessing that should be sought diligently in this country of magnificent distances."

Long-Haul Coal Passes Mines

Another extract from his speech which has attracted particular attention is this one: "The long-haul coal on its way to market often crosses coal fields and passes coal mines which alone and unaided could fully supply the market needs for years to come. The complaint is of long standing, and its result has been millions of useless ton-miles, with periodic car shortages the critical symptom. I do not forget that, through an unrelated group of circumstances, it happens that in periods of mine-labor dispute these distant coal mines have proved an insurance policy to the industries of the country,

yet at what a price in transportation!

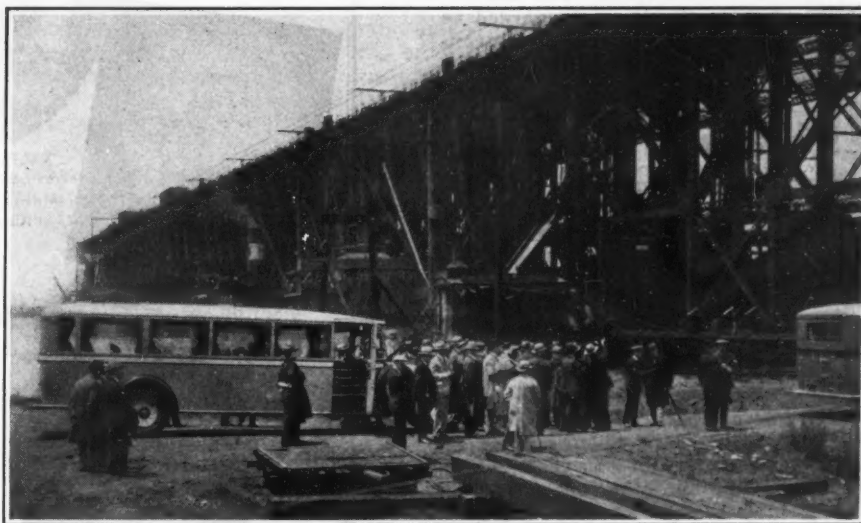
"Those distant mines have earned for the railroads only about one-half as much per ton-miles as the mines whose output they displaced, and the layman wonders who pays the freight. Perhaps it is obvious that the antiquated rule of charging what the traffic will bear is not wholly absent in the rate structure of today. Which has been the chief concern of the common carrier—the consumer or the producer?"

In this connection it may be of interest to quote the recommendation of the U. S. Coal Commission in the matter of long- and short-haul rates:

"Economy in the use of transportation also demands that the long haul of coal be no longer encouraged by favoring rates, established without adequate regard to the cost of the transportation service rendered. Much of the soft coal that is now produced and consumed in this country is transported undue distances, some of it on its way to market passing across fields that produce coal of similar character.

Urges Proper Relationship

"If coal were coal, so that it could be used for every and any purpose, instead of different kinds being required for different purposes, it might be desirable to zone the whole area of the country prohibiting the transportation of any coal beyond its natural market. But without adopting any artificial zoning of coal shipments, such as during the war served the double purpose of saving transportation and controlling distribution, there can be a reversal of the tendency to promote overdevelopment caused by widening the marketing territory through reduction of freight rates from certain fields relative to those from older and competing fields. Gradually and without undue violence to established conditions, the rates should be readjusted to re-establish more natural relations between the elements of cost and service which will make for economic zoning. The result will be a reduction in the total cost of transportation to the nation."



British Visitors Inspect Hampton Roads Piers

A party of leading business men and industrialists of Great Britain are touring the coal fields of Virginia and West Virginia. As guests of the Virginia State Chamber of Commerce, they recently were escorted to the Norfolk & Western Ry. coal pier at Lamberts Point to see how coal is loaded there. The illustration shows them arriving at the coal terminal.

N.C.A. Market Committee Urges Sectional Meetings

Plans and program for the sectional meeting of bituminous coal sales managers and agents, to be held at Chicago on the afternoon of June 16, in connection with the tenth annual meeting of the National Coal Association, and a recommendation to the board of directors that similar meetings be held during the coming year in various sections of the country, were agreed upon at a meeting of the marketing committee of the association held at the William Penn Hotel, Pittsburgh, Pa., May 20.

A number of subjects for consideration had been referred to the marketing committee by the special committee which considered the transcript of the meeting of bituminous coal sales managers and agents during the annual meeting in Chicago last year. Among these was a suggestion that the contract year be changed from April 1. After an extended discussion the committee took the position that a uniform date for making coal contracts was inadvisable and suggested to operators the practicability of staggering their contract dates.

The trade information committee of the National was commended for its efforts looking toward the collection and dissemination of trade information by local associations. The committee discussed the suggestion of standardization of sizes and reached the conclusion that marketing requirements make this a local matter, but urged its consideration by operators and by local associations in the hope that there might be as few sizes as possible.

The question of validity of contracts came up for discussion and there was unanimous agreement that coal contracts generally are as effective as those in other lines and that the degree of effectiveness rests largely with the makers thereof. It was decided that contract forms now in use would be studied by the members of the committee and that a later report would be made to the association. The consolidation of sales efforts was regarded as highly desirable and worthy of the consideration of operators in the various districts.

Sustains West Virginia Tax

The U. S. Supreme Court, in a decision read by Associate Justice McReynolds on May 16, sustained the constitutionality of the West Virginia severance tax, which is under the cloak of a tax on occupations. Thereby the court affirmed the decision of the West Virginia Supreme Court in the appeal of the Hope Natural Gas Co. against Grant P. Hall, State Tax Commissioner.

The gas company attacked the state tax, which is based upon production, and which applies also to coal mining, timber cutting and other operations, on the ground that it affected interstate commerce inasmuch as the law provides that "the measure of a tax is the value of the entire production in this state, regardless of the place of sale or the fact that delivery may be outside the state." This company sold much of its production in Pennsylvania and Ohio.

Decries Curb on Business At Bankers' Meeting

Enactment of a multitude of laws restricting personal rights is rapidly destroying every vestige of individual liberty in the United States, it was declared by Robert R. Carman, of Baltimore, former U. S. Attorney there, in an address May 19 before the thirty-second annual convention of the Maryland Bankers' Association in the Hotel Traymore, Atlantic City, N. J.

"We are told what we shall eat, and what we must not drink, and it is quite likely that we shall be told not to smoke. Private business is no longer private business, because laws tell us how to conduct it. There are 12,000 statutes enacted each year now, and a total of thirty million statutory laws in force," he said.

"The result is general disrespect for all laws, and worst of all, a growing percentage of our people feel that a term in jail is no longer a disgrace."

The Supreme Court decision is brief, being to the general effect that the tax is a reasonable exercise of the powers of the State of West Virginia, and that being on production and not on distribution, it is not an interference with interstate commerce.

Three I. C. C. Commissioners Urged for Reappointment

Alba B. Johnson, president of the Railway Business Association, has declared in favor of the reappointment of Interstate Commerce Commissioners Esch, Hall and Aitchison. "We strongly urge that geographical considerations should be subordinated to the national welfare," Mr. Johnson told the transportation and commerce committee of the United States Chamber of Commerce, gathered at Washington last week.


The administration's view of rail problems should not be injected into the Commission, Mr. Johnson said. "Some Senators of late have put to the nominees for the Commission questions indicating a line of thought which they evidently desired adopted," Mr. Johnson pointed out. "We believe senatorial inquiries might well be confined to matters affecting the ability, integrity and experience of the nominees."

35 Entombed by Fire In Japanese Mine

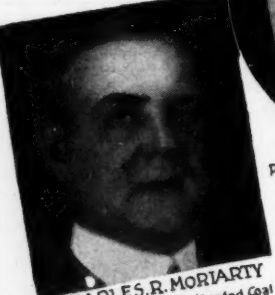
Thirty-five miners were entombed and one hundred and fifty others escaped, when fire broke out May 18 in a coal mine at Kyouteki, in the Saca prefecture of Japan.

Rescue parties were quickly organized and pressed into service in the hope that some of the entombed men might be still alive.


Five Members of the Marketing Committee THE NATIONAL COAL ASSOCIATION



RALPH KNODE
Pres General Coal Co.
Philadelphia Pa
CHAIRMAN




CHARLES R. MORIARTY
Vice Pres. Cabin Creek Consolidated Coal Co.
Cincinnati Ohio




GRANT STAUFFER
Pres Sinclair Coal Company
Kansas City Mo.

1927



H. A. GLOVER
Vice Pres. Knox Consolidated Coal Co.
Indianapolis Ind.



J. P. BRADIN
Sales Mgr. Pennsylvania Coal & Coke Corp.
New York City



News Items From Field and Trade



ALABAMA

New Stith Shaft Producing.—The Stith Coal Co. is now producing coal from its new shaft at America, Walker County. This shaft is about 340 ft. deep and is equipped with two balanced hoists of five tons capacity, which lift the coal from a concrete bin at the bottom of the opening and deposit it in a steel bin at the mouth, from which it is conveyed to the washery and preparation plant. The mine is equipped with all up-to-date facilities for mining and handling of coal, while the washery and preparation equipment is of the most modern design. The plant, which has a daily capacity of 3,200 tons, also will handle the output from a number of drift openings which have been operating for a number of years. A. B. Aldridge, Birmingham, is general manager of the company.

Benoit Drift to Open Soon.—The Benoit Coal Co. is preparing to open a slope mine near Dora, Walker County, to add to its production at that point. A number of drifts are now in operation. The new mine will be connected to the present tippie and washery, which will handle the output. C. S. Bissell, of Birmingham, is president of the company.

To Expand Warrior View Capacity.—It is reported that the Seaboard Coal Mining Corporation, which recently acquired the properties of the Warrior View Coal Co., on the Warrior River near Tuscaloosa, will make extensive improvements and increase production. The erection of a byproduct coke plant at New Orleans and the installation of a private barge service for transportation of the output of the mines to that point is said to be under consideration by Francis B. Wood, Eastern representative. Offices will be established in Birmingham.

The Yolande Coal & Coke Co. has placed a contract for a large electric hoist and a 700-hp. motor for its Connellsville mine. The steel tippie and headframe have been completed, and the washery and preparation plant remain to be contracted for. The work of reopening this slope, which has been under way for more than a year, will soon be finished and the daily production will be worked up to a high figure as soon as possible.

New Record for Coal Output.—Alabama produced 21,508,812 tons of coal during 1926, a record year's output, according to figures just given out by W. B. Hillhouse, chief of Alabama mine inspectors. Eleven counties in the state produced coal last year, Jefferson County leading with 10,702,514 tons, almost half of the state's total. The

largest output previous to 1926 was 20,919,303 tons in 1923.

A large coal bunkering machine of W. G. Coyle & Co., New Orleans, recently sank in 110 ft. of water in the Mississippi River, representing a loss of probably \$50,000. This firm is a subsidiary of the DeBardeleben Coal Corporation and is the distributing agency for its coal in the New Orleans territory.

COLORADO

Expansion to Cost \$100,000.—Improvements to cost at least \$100,000 will be made by the Huerfano Agency Co. in the Gordon mine, five miles northwest of Walsenburg, according to announcement by A. J. Merritt, president. Company plans call for the tapping of a new body of coal recently uncovered, digging of new slopes, and installation of new machinery, yards and other equipment throughout the mine.

Commission Allows Wage Cut.—Permission to reduce the wages of its miners has been granted by the State Industrial Commission to the Palisade Coal & Supply Co. The new wage will be \$5.40 a day instead of \$6.20. The miners had objected to the reduction on the ground that the company had failed to file a 30-day notice with the commission.

ILLINOIS

The State Mining Board will hold an examination of candidates for certificates as mine managers, first- and second-class hoisting engineers, mine examiners and electrical hoisting engineers at the State House, Springfield, commencing May 30.

The Red Top Coal Co., a Delaware corporation, capitalized for \$1,000,000, will exploit coal beds on a 600-acre tract in Williamson County at a point six miles east of Marion. The strip method of operation will be used. The Missouri Pacific R.R. is said to have agreed to build a branch line through the coal tract at a cost of \$300,000. The coal company has opened general offices in the Security Building, St. Louis, Mo., with C. A. Gent as general manager. Among the directors of the new company are former Mayor Henry Kiel of St. Louis and A. T. Spivey of East St. Louis, director of the Union Trust Co. and publisher of the East St. Louis Journal.

The United Mine Workers of Illinois, in convention at Peoria, Ill., on May 4 rejected the proposition for the formation of a Labor Party in Illinois.

To Rebuild Burned Structures.—Plans are being drawn up by the Superior Coal Co., Gillespie, to rebuild its engine plant and washery which were recently destroyed by fire.

Coal Men Oppose Distribution Census.—The census of distribution now being carried on by the government is not indorsed by the Chicago Wholesale Coal Shippers' Association. At a recent meeting the wholesalers decided it was best for individual members to deal with the question, which is understood to aim at disclosing tonnages handled by the wholesalers and at what cost.

County Sues for Cave Damage.—Suit for \$100,000 damages has been filed against the Donk Brothers Coal & Coke Co. of St. Louis, Mo., by Madison County, Illinois, for damage to the Madison County Tuberculosis Sanitarium near Edwardsville. County officials charge that the damage to the new building was caused by the sinking of the roof of the Thermal coal mine, above which the sanitarium was built. The coal company has denied liability for damage to the building, claiming that it was due to faulty construction and not caused by the mine.

INDIANA

The State of Indiana, through its conservation department, has received from the Patoka Coal Co. a gift of 157 acres of land adjoining the present tract of Turkey Run State Park. The Patoka company is controlled by James P. Goodrich, former Governor of the state.

The Crown Coal Co., Sullivan, has filed a preliminary certificate of dissolution.

KENTUCKY

To Study Accidents at Face.—At a recent meeting of Kentucky bituminous operators' local association officials, at Lexington, there was discussion of the co-operative study of accidents at the face in coal mines which has been under way in West Virginia for the past year. Suggestion that a similar study be inaugurated in Kentucky will be presented to the various associations for expression of opinion. Dr. J. W. Paul, of the U. S. Bureau of Mines, who was present, explained in detail the West Virginia study and offered the co-operation of the Bureau for a similar study in Kentucky. W. H. Jones, Chief Mine Inspector of Kentucky, expressed approval of the idea of such an effort in Kentucky and offered his co-operation.

At the annual stockholders' meeting of the Carrs Fork Coal Co., Inc., held at the mine office at Allock, the following officers were elected: Gilbert S. Monroe, president; G. E. Mathews, vice-president; Jos. T. Micklethwait, secretary, and Dr. Oscar R. Micklethwait, treasurer, all of Portsmouth, Ohio. The company has just closed one of its most successful years, under the management of J. B. Allen, general superintendent. The executive and general sales offices are located at Portsmouth, Ohio.

It would appear that the Kanawha field operators in West Virginia are extending their river distribution further South. For some years a good deal of that coal has been going to Louisville, which has been about the end of the downstream towing movement. During the third week in May, however, it was reported that the towboat Eugene Dana Smith with eight barges of coal was headed for Paducah, which is only about 50 miles from the confluence of the Ohio and the Mississippi.

It is announced from Carbon Glow, a mining town in the Lower Rockhouse Creek Valley, Letcher County, that the Chicago Coal & Docks Co., which recently purchased the plant of the Dudley Coal Co. there, is starting a big campaign of improvement, with the view of doubling capacity. The construction of 100 modern miners' houses already has been launched, while mine opening, tippie improvement, as well as general betterment, is starting.

State Rejects Fuel Bids.—Bids were opened on May 3 by the State Purchasing Commission for coal supplies to be used in the various state institutions over a period of one year starting July 1, 1927, but were discarded later as too high. New bids will be received. All contracts call for steam coal, either screenings or mine-run.

The Turner Coal Co., Middlesboro, has increased its capital stock from \$20,000 to \$30,000.

MISSOURI

Anti-Smoke Campaign Put Over.—Additional contributions to the three-year campaign fund of the Citizens' Smoke Abatement League of St. Louis, since the drive closed has raised the total to \$252,663 or \$2,663 above the quota set. This is the largest smoke-abatement program ever undertaken by any city in the United States. Chambers of Commerce and other civic and commercial organizations throughout this country and Canada have shown much interest in the St. Louis movement and have sought information as to the methods of abatement to be used in St. Louis.

St. Louis Coke & Iron Co. Sold.—The Utilities Power & Light Co. has purchased control of the St. Louis Coke & Iron Co., according to an announcement last week by W. G. McGuire, president of the latter company. The coke property is estimated to be worth about \$10,000,000. It produces 180,000 tons of pig iron and 500,000 tons of coke annually. Mr. McGuire said that he will continue in the management of



Looking Down the Incline of the Bonny Blue Coal Co.

At this new Virginia operation modern equipment and permanent construction are evident. Note the deep cut and heavy fill of the incline. The monitors, which are of 20-ton capacity, are of the drop-bottom type. The incline is 3,400 ft. long, has a maximum grade of 57 per cent, and the difference in elevation between top and bottom is 1,000 ft.

the company, but the same holding company will control the utility and manufacturing company. The manufacture of coke and pig iron will be continued.

NEW YORK

The Continental Coal Co., of Pittsburgh, Pa., and Fairmont, W. Va., has been awarded the contract for supplying 45,000 tons of slack coal to the Bureau of Water pumping stations at Buffalo. This company was the lowest bidder, with a price of \$.143. The same company is low bidder for 500 tons of nut and slack coal wanted by the Tonawanda (N. Y.) water works.

An unfamiliar sight at the port of Rochester a few days ago was an old-time lake schooner, the first to arrive there in ten years. The vessel was the "Mary Daryaw," with two masts and a top-sail. She had sailed across the lake from Kingston, Ont., for a cargo of coal, making the distance of about a hundred miles in daylight. She was built sixty years ago and is one of the three remaining freight schooners on Lake Ontario.

OHIO

Bids will be opened June 4 by the board of trustees of the Ohio Soldiers' and Sailors' Orphans' Home at Xenia for 6,000 tons of either mine-run or screened coal to be delivered on the B. & O. siding at the home. Provisions are made for analyzing each sample of coal submitted by bidders.

The Columbus Board of Education has awarded the contract on bids opened May 4 for 15,000 tons of Pomeroy mine-run for the various school build-

ings to the Bell Coal Co. of Columbus at \$4.24. At the same time the Board awarded the contract for 2,000 tons of West Virginia nut, pea and slack for the Central High School building to the Burns Coal Co., Columbus, at \$3.74. Both are delivered prices.

PENNSYLVANIA

To Fill Voids with Ashes.—Councilman Harry Apgar of Scranton definitely announced last week that in 1928 the city will establish a mine-flushing bureau as a direct attempt to solve the mine-cave evil and prevent further damage to buildings and streets in Scranton from surface settlements. Mr. Apgar said that engineers will make a study of underground conditions throughout the city and that in all old voids ashes will be flushed into the workings.

Girard Estate Wins Royalty Suit.—A decision just handed down by the Supreme Court of this state on coal-land leases probably will add thousands of dollars to the Stephen Girard Estate. The suit was pushed by the City of Philadelphia against the Lehigh Valley Coal Co., the city acting as trustee for the Girard Estate. The case involved the interpretation of certain clauses in leases of coal lands owned by the estate which provide for the payment of royalties on the quantity of coal mined each year by the lessees. The case at issue involved a balance of about \$7,000 in royalties, with interest from 1923, but it is said the case was really started as a test and that as a result of the high court's ruling other suits will be launched with as much as \$300,000 at stake. The Girard Estate took the case to the highest court on an appeal from a ruling handed down by the judges in Schuylkill County.

Ten Escape Death When Cage Falls.—Ten men had narrow escapes from being killed in a recent mishap at the Johnson mine of the Scranton Coal Co., Dickson City. The men had entered a cage to be lowered into the mine. When about 50 ft. from the foot of the shaft the engineer, George Brownell, suffered a fainting spell and lost control of the lever, letting the cage drop to the bottom. The cable was torn loose but the ten injured miners had been removed before the cable fell on top of the cage. Nine of the injured men were removed to hospitals, some of them having broken arms and legs.

Rainey Buys Simpson Plant.—W. J. Rainey, Inc., the largest independent coke interest in the Connellsville region, has purchased the plant of the Union Connellsville Coke Co., at Simpson, between the Rainey Allison plant and Brownsville. The consideration was not given. The plant, which was owned by J. H. Lynn, James R. Cray, D. W. McDonald and William Allison, has been in operation about 20 years. It consists of between 50 and 100 acres of coal, 150 push-type coke ovens, 50 houses and a commissary. The acquisition of this plant places ten operating plants in the Rainey organization. John Cole, assistant mine foreman at Allison,

has been transferred in charge of the additional operation. A few months ago W. J. Rainey, Inc., acquired the Old Home plant of W. J. Parshall in German township.

Indian Creek Tunnel Through.—Workmen engaged in driving a 4-mile tunnel to carry sulphur water from the mines of the Indian Creek valley past the reservoir of the Mountain Water Supply Co. completed the cut on the final section of the bore last week. With the completion of this work, operators in the valley will be prepared to comply with the court order requiring that mine drainage be eliminated from Indian Creek by June 1. By that date the acid-laden stream can be turned into the drainage tunnel and flume system.

Operators Buy Water Company.—Control of the Lansford Water Co., at Lansford, recently passed into the hands of the Lehigh Coal & Navigation Co. It is understood the coal company paid more than \$200,000 for the water concern. The purpose of the purchase has not been explained by the coal company officials.

VIRGINIA

Clinchfield Earnings Decline.—Clinchfield Coal Corporation reports for the quarter ended March 31, 1927, net income of \$82,269 after fixed charges and federal taxes, equivalent after preferred dividends and sinking fund, to 22c. a share earned on 145,476 shares of common stock. This compares with \$126,684, or 63c. a share, in the first quarter of 1926.

WEST VIRGINIA

Jaxon Again at Helm.—George S. Jaxon, manager of the Huntington district office of the Link-Belt Co., who had been incapacitated for several months by a serious illness which befell him last October, has fully recovered. He recently resumed his duties with the Link-Belt Co.

Probe Shannon Mine Blast.—Deputy State Mine Inspectors W. D. Lee, Thomas Stockdale and William Prentice were engaged last week in making an investigation of the explosion at the Shannon Branch mine of the Central Pocahontas Coal Co. in which eight miners lost their lives on the night of May 13. The inspectors are understood to have theories as to what caused the explosion but will make no statement until an inquest is held. Officials of the Central Pocahontas Coal Co. state that the damage caused by the explosion to the interior of the mine was not as serious as at first feared and therefore it is believed that the mine can be cleared up and be placed in readiness for operation in the near future.

Bethlehem Coal Co. Mines Sold.—The Bethlehem Fairmont Coal Co., a newly incorporated organization, took over the entire holdings of the Bethlehem Coal Co. in Harrison County and Marion County late last week. The Bethlehem Coal Co., had its headquarters in Fairmont and J. E. Watson is president of the company. Incorporators of the new organization are A. C.



From the Drift Mouth to the Tipple

On the tramroad of the Rogers Elkhorn Coal Co., at Virgie, in the Big Sandy field of Kentucky. The company operates in the upper Elkhorn seam, which is 60 in. thick at this point.

Brady of Mannington and Mary D. Devol, J. M. Moran, Noel P. Weaver and A. D. Martin, all of Fairmont. The new company is capitalized at \$350,000. The deal involves more than 1,300 acres of coal land in the Lincoln District, Marion County, and the Clay and Eagle districts, Harrison County, and the entire mine equipment and machinery and office furniture in the Bethlehem Building, where the Bethlehem company offices were located. The three mines transferred are the Helen's Run mine, in Marion County, including 741 acres of coal, the Scott mines on Mudlick Run and Shinn's Run and the Peoria mines on Bingamon Creek. The coal is in the Pittsburgh and Sewickley seams.

Firebugs Destroy Gates Tipple.—A fire which recently destroyed the tipple of the Gates mine of the Crystal Block Coal Co. at Sprigg, with a loss of nearly \$75,000, is thought to have been of incendiary origin. The tipple was one of the most modern in the Williamson field. During the period required to rebuild the tipple the men are to be given employment at the Crystal Block mine No. 1, at Rawl, and the No. 4 mine, at Stirrat, in Logan County. The Crystal Block operation at Sprigg was one of the largest in Mingo County. The plant was completely covered by insurance.

Arrest Youth for Dynamitings.—Gail Crites has been arrested by Harrison County authorities in connection with recent dynamitings of mines at Enterprise. Crites, a youth of 20, was taken into custody on the strength of a statement made to county officers by two residents of Enterprise whose names have not been divulged. According to them, Crites is alleged to have admitted using dynamite on mine structures. Crites denies having made any such admission or having had any part in the vandalism. There have been three dynamitings at Enterprise since the strike call of April 1, the latest case of that kind having been the destruction of the tipple of the Winchester Coal Co. on May 13.

Winchester Tipple Blown Up.—The tipple of the Winchester Coal Co., near Enterprise, was wrecked by an explo-

sion Sunday morning, May 22, caused by a high charge of explosive. It was the work of vandals, it is alleged by company officials, and an investigation is being made of the trouble. The company is owned by a Mr. Lawler and others.

CANADA

The Imperial Mining and Metallurgical Congress will be held in Canada next August and more than 1,000 men from various parts of the Dominion are expected to participate. The Royal Bank of Canada has issued a pamphlet telling of the plans for this meeting and also giving valuable information about the mineral resources of the country. Two tours have been planned for the visitors. One will leave Montreal on Aug. 23d and go through to the Pacific Coast, visiting the gold and silver fields en route. The other will accompany the first as far as Cochrane and then visit the Rouyn and other Eastern mining fields. A great part of Canada's mineral wealth is Alberta coal, but this wealth is largely potential and to realize upon it lower rail rates are needed.

Fuel Import Values Higher.—Total imports of coal into Canada during the fiscal year ending March 31 comprised 4,376,126 tons of anthracite, valued at \$35,091,257, and 13,079,418 tons of bituminous, valued at \$26,980,950. The totals for the preceding year were 3,256,631 tons of anthracite, valued at \$27,256,806, and 13,377,204 tons of bituminous valued at \$28,781,771. Imports of coal from the United States were 4,133,645 tons of anthracite, valued at \$32,800,889, and 13,074,698 tons of bituminous valued at \$26,958,685. The corresponding figures for the previous fiscal year were anthracite, 2,584,678 tons, costing \$20,852,269; bituminous, 13,321,097 tons, costing \$26,525,651.

The Granby Consolidated Mining, Smelting & Power Co. reports that it has received orders that will guarantee the working of its Cassidy colliery, near Nanaimo, Vancouver Island, at capacity for the next two years. It is erecting new coal bunkers to facilitate the filling of contracts.

Among the Coal Men

William Goodwin, a former associate state mine inspector in Alabama, has been appointed safety engineer for the Alabama By-Product Corporation, Birmingham. Mr. Goodwin is a recognized authority on mine rescue and safety work, in which he has taken an active and consistent interest for many years.

Major W. Clay Hepburn of Canterbury, England, general colliery manager of Pearson & Dorman Long, Ltd., with mines in Kent, England, arrived in Welch W. Va., last week and visited important operations in McDowell County. Major Hepburn is manager of the deepest mine in England, with a shaft depth of 3,000 ft. The seam opened up, which is 4½ ft. thick, was only recently discovered. The coal is said to closely resemble the Pocahontas coal mined in southern West Virginia.

Joseph Edwards of California, Pa., general superintendent of the Vesta Coal Co., Pittsburgh, Pa., has been appointed vice-president in charge of operations. The Vesta company is a subsidiary of the Jones & Laughlin Steel Corporation.

P. F. Ballou has been made manager of the Toronto office of the Pittsburgh Coal Co., Ltd., Metropolitan Building, which will handle sales in Ontario and Quebec of coal produced by the Pittsburgh Coal Co., Pittsburgh, Pa.

P. C. Graney of Mt. Hope, W. Va., has been appointed general manager of the C.C.B. Smokeless Coal Co., succeeding P. M. Snyder, who was elected president of the smokeless subsidiary as well as vice-president of the Massachusetts Gas Companies, the parent organization, following the death of Robert Grant of Boston. Mr. Graney has been with the smokeless company since its organization a year or so ago. **C. R. Stahl** of Stotesbury has been promoted to the post of division superintendent and **G. H. Thomas** of Helen also has been advanced to the same rank. Mr. Snyder had been general manager of the smokeless company until a short time ago, when he was elected president.

In connection with recent changes made in the managerial staff of the Kingston Pocahontas Coal Co., which operates several mines in southern West Virginia and Kentucky, **A. J. Bartlett**, who has been the superintendent of the mine at Marytown, W. Va., has been appointed superintendent at Hemphill, succeeding **J. B. Giltner**. **E. W. Price**, formerly superintendent at Belfry, Ky., has been appointed to take the place of **W. P. Goodwin** as superintendent at Warwick. **N. K. Pratt**, who has been superintendent for some time at Big Sandy, W. Va., has been given charge of the Marytown operation as well and will direct the activities of both mines.

Charles Pearson, Jr., vice-president of the Yates-Lehigh Coal Co., Buffalo, was one of the committee in charge of the Buffalo Horse Show, held during the third week of May.

M. S. Murray, recently appointed engineer of transportation of the Consolidation Coal Co., with headquarters in Fairmont, W. Va., has had extensive coal-mining experience in Pennsylvania, Kentucky and West Virginia, as engineer and general superintendent. He received an engineer's degree at Princeton in 1898, after which he was engaged for some time in railroad surveys.



M. S. Murray

A. Basham, manager of the Ernst Coal Co., Louisville, Ky., is recovering from an operation for appendicitis, at the Deaconess Hospital, at Louisville.

Obituary

Gardiner H. Reeves, president of the Reeves Coal & Dock Co., Minneapolis, Minn., died at Portland, Ore., May 13, where he had been visiting in the hope of regaining his health. Mr. Reeves was 64 years old. He established the company in 1910, which has grown to be one of the largest fuel concerns in Minneapolis. Mr. Reeves was former executive head of the Northwest Retail Coal Dealers' Association. He was in the service of the St. Paul & Duluth R.R. for 15 years. In 1896 he became identified with the Lehigh Valley Coal Co. and in 1905 was named executive head of the dealers' association.

Association Activities

The program for the annual convention of the M-O-I Coal Association, composed of dealers in Michigan, Ohio and Indiana, to be held at Cedar Point, Ohio, June 29 and 30 has about been completed by **B. F. Nigh**, secretary of the Association. The business session will start at 1 p.m. June 29 with **Harry J. Colman**, business analyst and coun-

sellor, Chicago, as the first speaker. Mr. Colman will give the results of a survey of the retail coal business in a number of cities in 1926. **Marshall Keig**, executive vice-president of the Consumers Company, Chicago, will speak on "Co-operation with the Producer and the Consumer." "Credits and Discounts" will be discussed by **Dewey Blocksma**, of the Breen & Halliday Fuel Co., Grand Rapids, Mich. **Charles A. Albright** of the Albright Coal Co., Cleveland, will talk on "Cost of Delivery." The banquet, which is an innovation on the program, will be held at 6 p.m., June 29. The toastmaster is to be announced later. The principal speaker will be **Harry Gandy**, executive secretary of the National Coal Association. The closing session will be held June 30 with **Victor Cherven**, chief engineer of the Holland Furnace Co., Holland, Mich., as the principal speaker. He will discuss "Relationship Between the Coal Dealer and the Heating Contractor." **Harry Miles** of the Reliable Coal Co., Columbus, will talk on "Direct Advertising."

The strike will not have much effect on the coal supply of the Southwest for some time, according to several coal authorities at the first annual convention of the Missouri Valley Retail Coal Merchants' Association, which convened at the Hotel President, Kansas City, Mo., for a 2-day meeting. Seventy per cent of all coal mined in the district was of non-union production, it was said by **James P. Andriano** of St. Joseph, president of the association. According to **George T. Kinney** of Kansas City, vice-president of the organization, the present coal supply will be sufficient for all demands until the peak next fall and winter. He doubted there would be an appreciable shortage at that time. About 300 persons attended.

Publications Received

Ventilation of Vehicular Tunnels, by **A. C. Fieldner**, **Y. Henderson**, **J. W. Paul**, **R. R. Sayers** and others. Report of U. S. Bureau of Mines to New York State Bridge and Tunnel Commission and New Jersey Interstate Bridge and Tunnel Commission. Reprinted from Journal of American Society of Heating and Ventilating Engineers. Pp. 171; 6x9 in.; illustrated.

Coal Mine Fatalities in the United States, 1925, by **W. W. Adams**, Bureau of Mines, Washington, D. C. Bulletin 275. Price, 20c. Pp. 129; 6x9 in.

Twentieth Anniversary Year Book, 1907-1927, Swedish Chamber of Commerce of the United States of America. Price, \$1. Pp. 209; 6x9 in.

Saward's Annual, 1927, by **Frederick W. Saward**, assisted by **James P. Mahoney**, **Guy H. Burbank** and editorial and office staffs of *Saward's Journal*. Price, \$2.50. Pp. 256; 6x8 in. Contains details relative to output, prices, freight rates, exports, trade conditions, and other information of interest to wholesale and retail coal men.

Fourteenth Annual Report of the State Inspector of Coal Mines of Colorado. Pp. 80; 6x9 in.; tables. Covers the year 1926.



Production And the Market



Industrial Consumers Hold Out for Bargains; Hard-Coal Demand More Active

Despite the early opening of lake navigation, with heavy movement almost from its inception, this business continues to be the outstanding factor in the bituminous coal trade of the country. In other respects, however, there is little cause for cheer for even the most optimistic observer of market developments, unless it might be based on the forlorn hope that the present advanced stage of seasonal dullness may presage its early end.

The labor situation, if anything, has shrunk in importance as an element in the market as the suspension of mining in the old Central Competitive Field and the Southwest enters its eighth week. While the stalemate holds down production in those areas the average industrial consumer continues to rely upon his storage pile for the bulk of his current requirements. Railroads, utilities and a few other industries, it is true, are taking tonnage on existing contracts, but spot business is conspicuously scarce.

Buyers Angle for Bargains

Bargain inducements are necessary in most instances to entice backward buyers and, with accumulations of "no bills" heavy, such offers are far from exceptional. Considering the widespread prevalence of light demand, therefore, the relative freedom on non-union producers from labor difficulties finds them far from "sitting pretty."

Seasonal influences in consumption as well as in buying, in the light of heavy stockpiles, will play their usual part in ordaining the time for a revival of consumer interest.

The softening tendency spread quite generally throughout the Midwestern markets last week, even spreading to Cincinnati, where lighter buying and increasing requests for cancellation or suspension of orders previously placed caused an easing in tone. Waning demand is slowing up production in Kentucky and prices are declining. Demand improved slightly in the Pittsburgh market, but sellers are forced to use pressure. On the Atlantic seaboard business is at a standstill.

Average Price Level Low

Coal Age Index of spot bituminous prices—which has been revised to allow for the change in distribution of production brought about by the suspension of operations at union mines—on May 23 was 154 and the corresponding weighted average price was \$1.86.

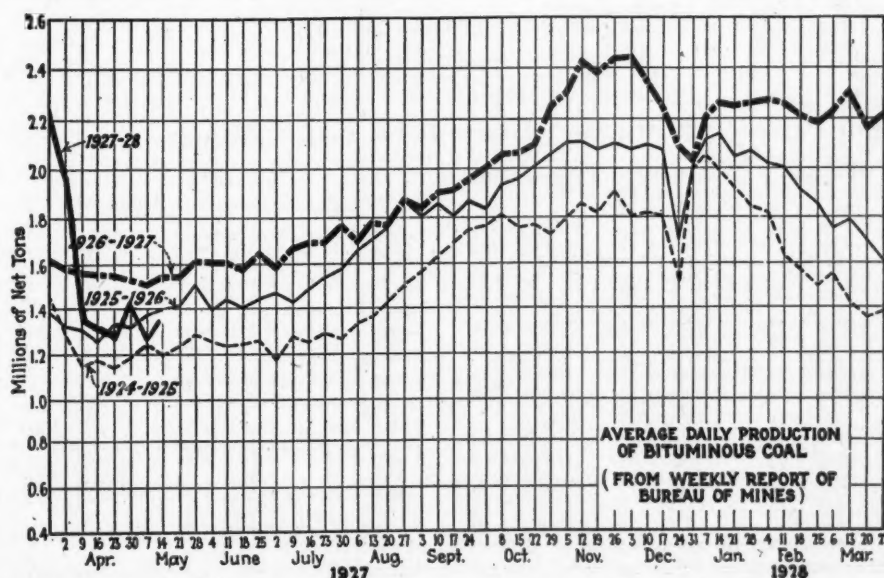
Production of bituminous coal registered a slight increase during the week ended May 14, when, according to the U. S. Bureau of Mines, the total was 8,384,000 net tons. This compares with an output of 8,185,000 tons in the preceding week. Loadings for the first two days of last week, however, fell 1,910 below the total for the same days of the week before.

Peace between the warring labor factions in Illinois, Indiana, Ohio, western Pennsylvania, the Southwest and Iowa still seems remote. Operators and union representatives from central Pennsylvania are meeting in Philadelphia in the effort to negotiate a new agreement as this is written, but it would be a sanguine prophet that would predict an early settlement of the points at issue. In the other fields the situation is unchanged.

Hard Coal in Good Demand

Anthracite producers are enjoying good running time and output is moving with freedom. The advance in company circulars scheduled for June 1 as well as unseasonable weather has held up demand. The immediate outlook is favorable, too, with most of the fill-up business still to come. All domestic sizes but nut are moving well; pea is scarce. The steam sizes are somewhat easier, with a small surplus of No. 1 buckwheat due to heavier output. Independent prices are almost on a level with company quotations.

The Connellsville beehive coke market is markedly apathetic. Notwithstanding the steady curtailment of output spot prices continue to sag. Spot quotations on furnace coke are \$2.85 @ \$3 and there is tonnage on track. Foundry coke is \$4 @ \$4.75, but there is little demand.



Estimates of Production

(Net Tons)

BITUMINOUS

	1926	1927
April 30.....	9,125,000	8,424,000
May 7 (a).....	9,039,000	8,185,000
May 14 (b).....	9,299,000	8,384,000
Daily average.....	1,550,000	1,397,000
Cal. yr. to date (c)...	203,959,000	221,193,000
Daily av. to date.....	1,791,000	1,942,000

ANTHRACITE

April 30.....	2,098,000	1,921,000
May 7 (a).....	1,985,000	1,866,000
May 14 (b).....	1,904,000	1,990,000
Cal. yr. to date (c)...	23,456,000	29,494,000

BEEHIVE COKE

April 30.....	210,000	176,000
May 7 (a).....	212,000	155,000
May 14 (b).....	203,000	148,000
Cal. yr. to date (c)...	5,323,000	3,513,000

(a) Revised since last report. (b) Subject to revision. (c) Adjusted to equalize number of days in the two years.

Interested Only in Bargain Offers

Bargain offers alone interest industrial buyers in Chicago and other Middle Western markets. Enough coal is moving out of western Kentucky and Indiana to give the consumers a chance to beat down prices and even add to their stockpiles. The domestic market is stagnant. Most Illinois mines still carry "no bills" of 6-in. lump at the mines. Eastern coals are harder to move, with high-volatile fuel less in demand than low-volatile tonnage.

During the past week one large railroad order for western Kentucky mine-run was placed at \$1.35. This was a drop of 15 to 25c. from quotations current April 1. Western Kentucky slack is easy at \$1.40; some distress tonnage has sold at less and a few shippers favorably situated demand more. Purchasing agents still look askance at offers from Indiana mines which have made peace with the union.

With western Kentucky also fighting

for domestic business, retailers are not anxious to order on coal from Illinois. Southern Illinois quotations on unbilled cars are unchanged. Attempts to increase the asking price on Standard lump to \$4 have met with no success and some track coal has been sold as low as \$2.25. The situation in the local St. Louis market is unchanged; country domestic and steam demand is quiet.

Demand Holds Down Production

Slow demand is holding back production in the Kentucky fields and "no bills" are accumulating. The lakes are taking a fair amount of eastern Kentucky tonnage, but the increased output of screened coal has weakened the market on slack, which now is selling for \$1.10, as against \$1.25 a few days ago. Although production in the western part of the state has been slowed down, prices on all sizes have declined.

Shipments of bituminous coals from the docks at the Head of the Lakes are running above the seasonal average.

This is attributed to the desire of industrial consumers to build up stockpiles as insurance against any change in the labor situation which might interfere with the free flow of non-union tonnage to the Northwest. Railroads also are moving coal from the docks to the coaling stations.

The second week of the month saw a slight drop in the number of cargoes discharged at Superior and Duluth, but no particular concern is voiced. As of May 1 the docks had approximately 1,666,000 tons of bituminous coal and 391,000 tons of anthracite. Most of this tonnage had already been covered by orders and there was no disposition to add substantially to the number of commitments.

During April the docks received 188,302 tons of bituminous and 44,900 tons of anthracite. Last year no coal was received until May 9. Operators estimate that this season's receipts will approximate 10,000,000 tons of bituminous and something less than 1,000,-

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	May 24 1926	May 9 1927	May 16 1927	May 23 1927†	Midwest		Market Quoted	May 24 1926	May 9 1927	May 16 1927	May 23 1927†
Smokeless lump	Columbus...	\$3.10	\$3.35	\$3.35	\$3.50@3.75		Franklin, Ill. lump	Chicago...	\$2.60	\$3.15	\$3.15	\$3.15	
Smokeless mine-run	Columbus...	2.05	2.15	2.20	2.10@2.30		Franklin, Ill. mine-run	Chicago...	2.40	2.60	2.60	2.60	
Smokeless screenings	Columbus...	1.25	1.35	1.10	1.00@1.25		Franklin, Ill. screenings	Chicago...	1.90	2.10	2.10	2.10	
Smokeless lump	Chicago...	3.10	3.35	3.35	3.25@3.50		Central, Ill. lump	Chicago...	2.30	2.85	2.85	2.75@3.00	
Smokeless mine-run	Chicago...	2.00	2.05	1.90	1.80@2.00		Central, Ill. mine-run	Chicago...	2.05	2.35	2.35	2.35	
Smokeless lump	Cincinnati...	3.10	3.10	3.50	3.25@3.50		Central, Ill. screenings	Chicago...	1.75	2.10	2.10	2.10	
Smokeless mine-run	Cincinnati...	1.85	2.25	2.25	2.25		Ind. 4th Vein lump	Chicago...	2.40	3.05	3.05	3.00@3.15	
Smokeless screenings	Cincinnati...	1.30	1.85	1.85	1.75@2.00		Ind. 4th Vein mine-run	Chicago...	2.15	2.45	2.45	2.45	
*Smokeless mine-run	Boston...	4.40	4.40	4.40	4.35@4.50		Ind. 4th Vein screenings	Chicago...	1.80	2.10	2.10	2.10	
Clearfield mine-run	Boston...	1.80	1.70	1.70	1.60@1.85		Ind. 5th Vein lump	Chicago...	2.15	2.65	2.65	2.60@2.75	
Cambria mine-run	Boston...	2.05	2.05	2.05	1.85@2.25		Ind. 5th Vein mine-run	Chicago...	1.95	2.10	2.10	2.00@2.25	
Somerset mine-run	Boston...	1.90	1.80	1.85	1.75@2.00		Ind. 5th Vein screenings	Chicago...	1.35	1.90	1.90	1.85@2.00	
Pool 1 (Navy Standard)	New York...	2.60	2.75	2.75	2.50@3.00		Mt. Olive lump	St. Louis...	2.35	3.00	3.00	3.00	
Pool 1 (Navy Standard)	Philadelphia...	2.65	2.85	2.85	2.75@3.00		Mt. Olive mine-run	St. Louis...	2.15	3.00	3.00	3.00	
Pool 1 (Navy Standard)	Baltimore...	1.95	2.15	2.15	2.10@2.25		Mt. Olive screenings	St. Louis...	1.55	2.00	2.00	2.00	
Pool 9 (Super. Low Vol.)	New York...	2.10	2.10	2.05	1.90@2.25		Standard lump	St. Louis...	2.25	2.75	2.75	2.75	
Pool 9 (Super. Low Vol.)	Philadelphia...	2.10	2.15	2.15	2.00@2.30		Standard mine-run	St. Louis...	1.80	2.00	2.00	2.00	
Pool 9 (Super. Low Vol.)	Baltimore...	1.75	1.80	1.80	1.75@1.85		Standard screenings	St. Louis...	1.30	1.75	1.75	1.75	
Pool 10 (H.Gr. Low Vol.)	New York...	1.85	1.75	1.75	1.65@1.90		West Ky. block	Louisville...	1.75	1.90	1.90	1.75@2.00	
Pool 10 (H.Gr. Low Vol.)	Philadelphia...	1.85	1.80	1.80	1.70@1.90		West Ky. mine-run	Louisville...	1.20	1.60	1.60	1.40@1.60	
Pool 10 (H.Gr. Low Vol.)	Baltimore...	1.60	1.65	1.65	1.60@1.70		West Ky. screenings	Louisville...	1.10	1.60	1.60	1.40@1.60	
Pool 11 (Low Vol.)	New York...	1.60	1.60	1.60	1.50@1.75		West Ky. block	Chicago...	1.75	1.65	1.65	1.60@1.75	
Pool 11 (Low Vol.)	Philadelphia...	1.55	1.65	1.65	1.55@1.75		West Ky. mine-run	Chicago...	1.15	1.45	1.45	1.35@1.45	
Pool 11 (Low Vol.)	Baltimore...	1.45	1.55	1.55	1.50@1.60								
High-Volatile, Eastern							South and Southwest						
Pool 54-64 (Gas and St.)	New York...	1.40	1.50	1.45	1.35@1.60		Big Seam lump	Birmingham...	2.15	2.15	2.15	1.90@2.40	
Pool 54-64 (Gas and St.)	Philadelphia...	1.45	1.45	1.45	1.35@1.60		Big Seam mine-run	Birmingham...	2.00	1.60	1.70	1.50@1.90	
Pool 54-64 (Gas and St.)	Baltimore...	1.25	1.50	1.50	1.45@1.55		Big Seam (washed)	Birmingham...	2.00	1.85	1.85	1.75@2.00	
Pittsburgh sc'd gas	Pittsburgh...	2.25	2.45	2.50	2.40@2.60		S. E. Ky. block	Chicago...	2.40	1.70	1.70	2.10@2.35	
Pittsburgh gas mine-run	Pittsburgh...	2.00	2.20	2.20	2.15@2.25		S. E. Ky. mine-run	Chicago...	1.65	1.50	1.50	1.40@1.65	
Pittsburgh mine-run (St.)	Pittsburgh...	1.80	2.15	2.10	2.00@2.20		S. E. Ky. block	Louisville...	2.05	2.25	2.25	2.00@2.50	
Pittsburgh slack (Gas)	Pittsburgh...	1.35	1.50	1.50	1.45@1.60		S. E. Ky. mine-run	Louisville...	1.50	1.60	1.60	1.50@1.75	
Kanawha lump	Columbus...	2.05	2.35	2.35	2.25@2.50		S. E. Ky. screenings	Louisville...	1.10	1.35	1.35	1.10@1.35	
Kanawha mine-run	Columbus...	1.55	1.60	1.60	1.50@1.75		S. E. Ky. block	Cincinnati...	2.10	2.35	2.35	1.65@2.60	
Kanawha screenings	Columbus...	.90	1.15	1.25	1.15@1.35		S. E. Ky. mine-run	Cincinnati...	1.50	1.55	1.60	1.25@1.85	
W. Va. lump	Cincinnati...	1.85	2.10	2.10	1.75@2.50		S. E. Ky. screenings	Cincinnati...	1.00	1.25	1.25	1.00@1.35	
W. Va. gas mine-run	Cincinnati...	1.45	1.65	1.60	1.50@1.75		Kansas lump	Kansas City...	4.00	4.35	4.35	4.25@4.50	
W. Va. steam mine-run	Cincinnati...	1.30	1.35	1.40	1.25@1.50		Kansas mine-run	Kansas City...	3.00	2.85	2.85	2.75@3.00	
W. Va. screenings	Cincinnati...	1.05	1.15	1.20	1.00@1.35		Kansas screenings	Kansas City...	2.50	2.50	2.50	2.50	
Hocking lump	Columbus...	2.35	2.25	2.25	2.00@2.50								
Hocking mine-run	Columbus...	1.55	1.65	1.85	1.75@2.00								
Hocking screenings	Columbus...	1.05	1.25	1.30	1.20@1.35								
Pitts. No. 8 lump	Cleveland...	2.10											
Pitts. No. 8 mine-run	Cleveland...	1.70											
Pitts. No. 8 screenings	Cleveland...	1.20											

*Gross tons, f.o.b. vessel, Hampton Roads.

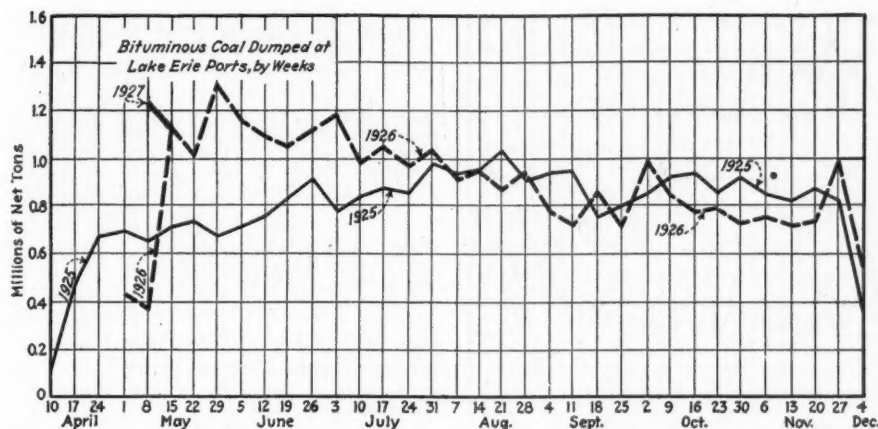
†Advances over previous week shown in heavy type; declines in italics.

‡Quotations withdrawn because of strike.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	May 24, 1926		May 16, 1927		May 23, 1927†	
				Independent	Company	Independent	Company	Independent	Company
Broken	New York...	\$2.34			\$8.25@9.25		\$8.25@8.50		\$8.25@8.50
Broken	Philadelphia...	2.39		\$9.25	9.00@9.25		8.25@8.50		8.25@8.50
Exg.	New York...	2.34		8.75@9.25	8.75@9.25		8.25@8.35		8.25@8.35
Exg.	Philadelphia...	2.39		9.25@9.75	9.15@9.25		8.25@9.00		8.25@9.00
Exg.	Chicago...	5.06		8.48	8.13		7.63		7.63
Stove	New York...	2.34		9.25@9.75	9.25@9.50		8.60@8.95		8.75@8.95
Stove	Philadelphia...	2.39		9.60@10.00	9.35@9.50		8.85@9.50		8.85
Stove	Chicago...	5.06		8.84	8.33@8.58		8.08		8.08
Chestnut	New York...	2.34		8.75@9.25	8.75@9.15		8.25@8.50		8.25@8.35
Chestnut	Philadelphia...	2.39		9.25@9.50	9.00@9.15		8.25@9.00		8.25@8.35
Chestnut	Chicago...	5.06		8.71	8.38@8.50		7.63		7.63
Pos.	New York...	2.22		6.50@7.25	6.00@6.25		5.50@6.50		6.00@6.50
Pos.	Philadelphia...	2.14		6.50@7.00	6.00@6.50		6.00@6.75		6.00
Pos.	Chicago...	4.79		6.03	5.65@5.80		6.10		6.10
Buckwheat No. 1	New York...	2.22		1.70@2.25	3.00@3.50		2.50@2.75		2.50@3.00†
Buckwheat No. 1	Philadelphia...	2.14		2.00@2.50	2.50@2.75		2.50@3.00		2.50
Rice	New York...	2.22		1.50@1.85	2.00@2.25		1.70@1.85		2.00@2.25
Rice	Philadelphia...	2.14		1.75@2.25	2.00@2.25		2.00@2.25		2.00@2.25
Barley	New York...	2.22		1.25@1.50	1.50@1.75		1.20@1.50		1.50@1.75
Barley	Philadelphia...	2.14		1.50@1.60	1.75		1.50		1.50
Birdseye	New York...	2.22		1.30@1.60	2.00		1.40@1.60		1.40@1.60

*Net tons, f.o.b. mines. †Advances over previous week shown in heavy type; declines in italics. ‡Domestic buckwheat (D. L. & W.), \$3.50



000 tons of anthracite. Current quotations are firm. Buying of bituminous grades is active, but orders for anthracite are backward.

Smokeless in Demand

Pocahontas continues to be the feature of the trade at Milwaukee. The demand is strong, especially for lump, which has advanced 50c. Retail distributors now charge \$10.75 for chute delivery and \$11.50 when the coal is carried in. Wholesalers report a quickening interest in anthracite, brought about by the increases scheduled for June 1.

The tone of the trade in the Twin Cities shows moderate improvement. Steam and—to a lesser extent—domestic buying are a little better. Utilities as well as the railroads are contracting more freely, but no concern over the strike is in evidence.

Southwestern coal is finding its largest outlet at present in railroad contracts. Country retailers in Kansas are beginning to accumulate stocks for next winter's needs, urged by the possibility of the strike being prolonged. Kansas City dealers, however, have unusually large stocks. The Spadra mines, in Arkansas, are not expected to open before the middle of June. A few strip pits are taking care of the demand in Kansas and Missouri. Oklahoma, practically free from labor trouble, due to the field being 90 per cent open-shop, is producing nearest normal. Prices are unchanged.

Unrelieved dullness prevails also in the Colorado market, with "no bills" increasing. There have been no changes in prices. Labor is plentiful, but running time at the mines averages only about two and one-half days a week. No prospect of improvement is anticipated for a month or more.

Cincinnati Market Easier

There was an easier tone to the Cincinnati market last week as the result of a falling off in the volume of buying and a rising tide of requests for cancellation or suspension of orders placed earlier in the season. Lake buyers took advantage of the situation by picking up tonnage in the spot market. Consumers with large reserves on hand were reported to be digging into their stockpiles.

The low-volatile market is more sluggish. Lump and egg, which were driven up to \$3.50, have slipped back to \$3.25, although an occasional order is still taken at \$3.50. June bookings are

lighter. In the high-volatile division, efforts to move unbilled eastern Kentucky coal forced some 4- and 6-in. lump down to \$1.65 and some slack to \$1. Other interests, however, still stick to higher prices on all sizes.

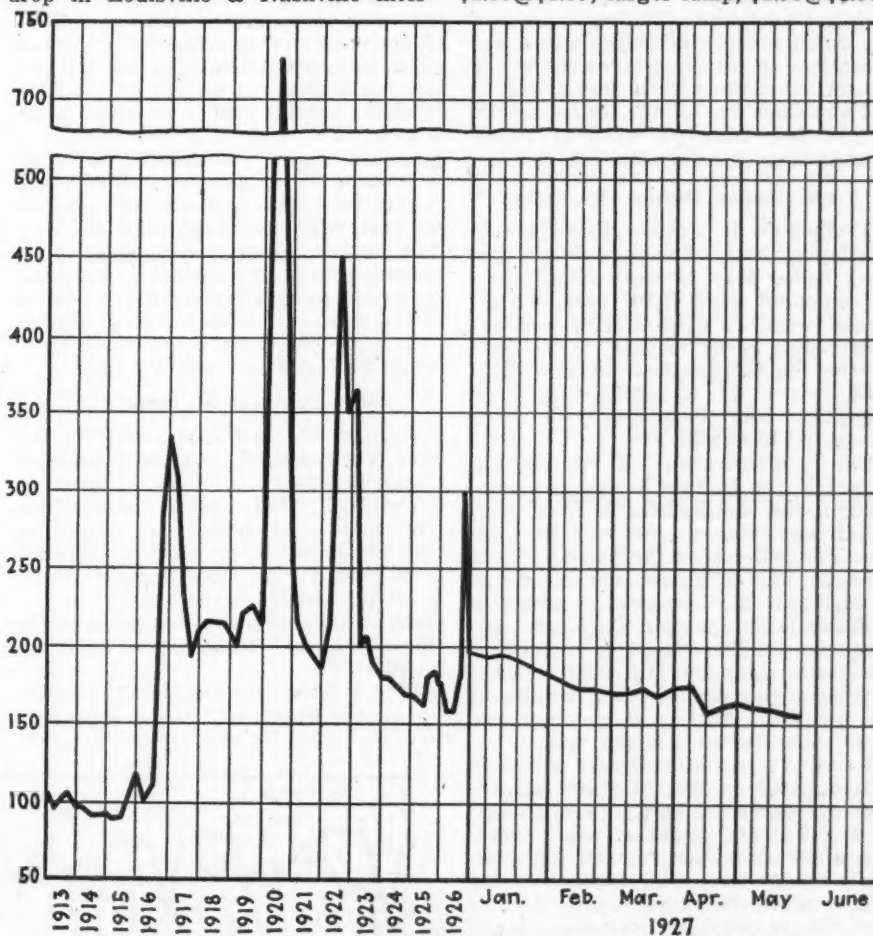
Coal movement through the Cincinnati gateway last week totaled 15,670 cars, or 10 cars less than in the preceding week. Compared with last year, however, the movement showed an increase of 1,590 cars. There was a sharp drop in Louisville & Nashville inter-

change and a sharp increase in Chesapeake & Ohio loadings. The number of empties en route to the mines increased from 13,160 to 14,806 cars.

Domestic Buying Leads at Columbus

Retail buying is the best feature of the Columbus market. Retail distributors find an increased demand from household consumers and this is reflected in greater firmness in wholesale quotations on West Virginia offerings. Industrial consumers, on the other hand, are turning to their stockpiles and will buy spot tonnage only when the prices quoted are particularly advantageous. Spot slack is weaker, but there is little real distress tonnage.

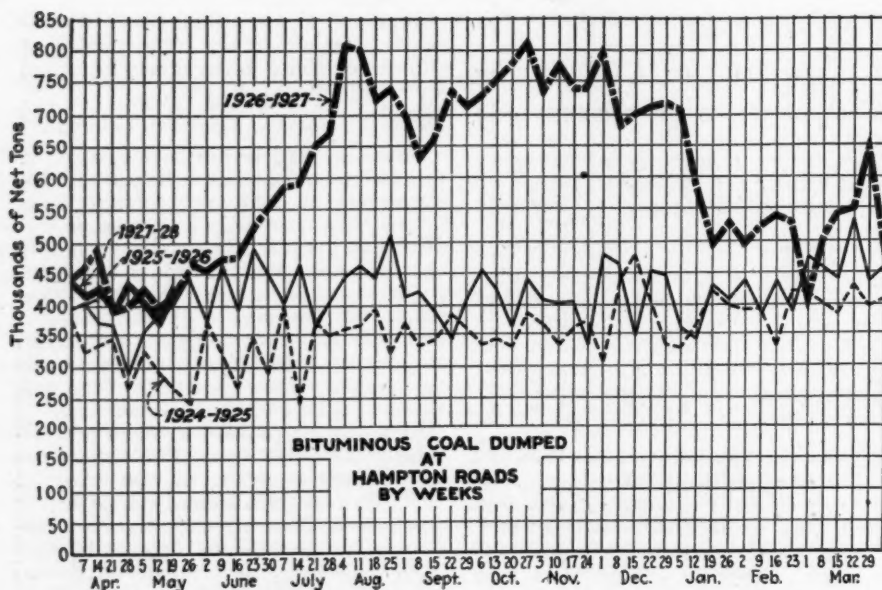
Demand for coal, both steam and domestic, is so slow in the Cleveland market that price-cutting is the order of the day. Distress tonnage adds to the weakness. The only exception is Pocahontas lump, which is firm at \$3.50@ \$3.75. There is still some No. 8 coal available at \$2@ \$2.60 for lump, \$1.65 @ \$1.70 for mine-run and \$1.20@ \$1.25 for slack, but the quantity is limited. Moundsville slack is offered at \$1@ \$1.05; mine-run, \$1.60@ \$1.65; nut and slack, \$1.05@ \$1.10; three-quarter lump, \$1.80@ \$1.85; larger lump, \$1.90@ \$2.50.



Index	1927					
	May 23	May 16	May 9*	May 2*	May 24	May 25
Weighted average price.....	\$1.86	\$1.87	\$1.90	\$1.91	\$1.89	\$1.96

This diagram normally shows the relative, not the actual, price on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportion each of slack, prepared and run of mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke: 1913-1918," published by the Geological Survey and the War Industries Board. Owing to the suspension of operations in certain unionized fields the figures since April 2 have been reweighted to cover present-day tonnage. Figures for May 16 and 23 are tentative only.

*Revised.



A slight improvement in demand was noticeable in the Pittsburgh district last week. Nevertheless, all the pressure still comes from the sellers, and prices in the Pittsburgh, Connellsville and Westmoreland County districts have not advanced. The suspension of the union mines has helped non-union operations in the Bessemer area in the matter of running time, but prices on nut and slack are off 10c. and mine-run is 15c. less than on April 1; three-quarter lump has dropped 5c.

Pennsylvania Output Declining

Production in central Pennsylvania is slipping back. Loadings during the week ended May 14 were 25,209 cars, as compared with 27,107 cars for the second week in April. There are approximately 3,500 "no bills" in the field. Current quotations are: Pool 1, \$2.50 @ \$2.75; pool 71, \$2.25 @ \$2.35; pool 9, \$2 @ \$2.15; pool 10, \$1.75 @ \$1.85; pools 11 and 18, \$1.65 @ \$1.70.

The conservatism of purchasing agents in the Buffalo bituminous market is hardly distinguishable from stagnation according to the men who are trying to sell coal in the market. West Virginia high-volatile slack is offered at \$1.25 @ \$1.35. Low-volatile mine-run is \$3.25; lump and egg, \$3.75, with demand very light. Most of the industrial consumers are still well fortified with storage coal and seem willing to gamble that slack will not advance more than 25c. later in the year.

Except for a slight upward tendency in quotations on West Virginia smokeless coal, there has been no real change in the Toronto situation this month. Household consumer demand has been fairly steady with more stable weather and retail distributors report a comfortable volume of business. Local storage reserves are heavy. The suspension of operations in the Central Competitive Field has left no impress on Ontario trade.

New England Marks Time

The New England market is devoid of startling developments. There is little inquiry for steam coals and no special sales pressure. Contract shipments are moving at a normal rate, but the trade absorbs only a relatively

small tonnage of spot coal. With industry not overactive, there are no indications of any early improvement in the situation.

Accumulations, however, are less in evidence at the Hampton Roads piers than was the case a month ago. Most of the agencies are making a strong effort to co-ordinate supply and day-to-day requirements. Except in the case of slack, distress coal is not often mentioned. The current prices on Navy Standard range \$4.35 @ \$4.50, with an occasional sale of selected coal at \$4.60.

The tidewater and all-rail markets for central Pennsylvania coals are very dull. Prices are at a minimum and, for the present, the outlook is anything but encouraging. The territory is being closely combed for spot orders. Prices f.o.b. cars for standard smokeless coals range \$5.75 @ \$6 per net ton, Boston.

Spot Business at Standstill

Most of the soft coal moved in the New York market last week was on contract. Spot buying was almost at a standstill. There is no demand for free coals. Consumers are using up their stockpiles, determined, apparently, to let the future take care of itself. Sales are made at the buyers' terms. Current quotations are approximately the same as those in effect two months ago.

Philadelphia also reports little activity in spot bituminous coal. Warnings that the situation has serious possibil-

Car Loadings and Supply

	Cars Loaded—	
	All Cars	Coal Cars
Week ended May 14, 1927.....	1,029,126	163,150
Week ended May 7, 1927.....	1,024,416	156,668
Week ended May 15, 1926.....	1,030,162	167,673
Week ended May 8, 1926.....	996,527	162,453

	Surplus Cars—		Car Shortages—	
	All Cars	Coal Cars	All Cars	Coal Cars
May 8, 1927...	245,113	82,395
April 30, 1927...	259,736	90,075
May 8, 1926...	270,385	105,108

ities both from the standpoint of supply and from that of price fall upon deaf ears. There is a mild improvement in demand for soft coal for domestic consumption, but the total volume of this particular class of business is very light. The tidewater situation is colorless.

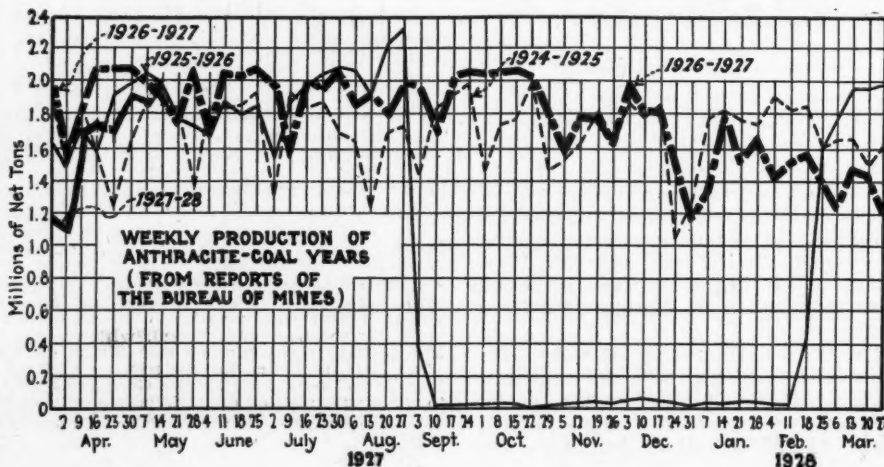
At Baltimore, too, industries are relying more upon accumulated stockpiles than upon current production to take care of their requirements. Some of the plants that have eaten sharply into their reserves, however, are beginning to seek additional tonnage. This gives some hope of higher prices, but the fact remains that at present operating mines are still struggling to keep their output moving.

Summer Dullness Rules Market

Summer dullness is in full swing in the Birmingham district. Consumers are holding down buying orders to the minimum and reduced industrial activity has slowed up deliveries of coal on contract. Retailers have not been buying as liberally as was the case last year and no improvement is expected before August. Foundry coke holds at \$6 for spot and \$5.50 for contract business. Domestic coke sales are light.

Domestic anthracite is in better demand in the New York market. While most of the buying is in anticipation of June 1 advances rather than the result of depleted retail stocks, unseasonable weather has meant a heavier spring consumption of fuel. The bulk of the fill-up business, therefore, is still to come. Independent prices are close to full company circular. The steam market shows little change.

Buying is more active at Philadelphia. During the past week the mines enjoyed good running time and it has been easy to move all the domestic sizes but nut. Pea is scarce. Cool weather sustains a demand for coal for immediate consumption. The increased



productive activity of the mines has resulted in a small surplus of No. 1 buckwheat. Rice and barley also are easier.

Push Early Buying Campaign

Baltimore retailers have been urging consumers to take in coal this month to avoid higher prices on June deliveries. The campaign, however, has been only moderately successful. Local trade at Buffalo is somewhat backward. Lake shipments also have been falling off. Up to May 8 the clearances totaled 230,363 net tons. Toronto dealers are quoting \$15 on stove, \$14.50 on egg and nut and \$12.50 on pea.

The Connellsville coke market is still in the dumps. Despite the fact that merchant-oven production has declined to 60 per cent of the rate prevailing in March, spot quotations on furnace coke are down to \$2.85@\$.3 and there is tonnage on track. Foundry coke is held at \$4@\$.475, but the demand is extremely light. Operators are in a poor position to negotiate third-quarter contracts on the second-quarter basis of \$3.50.

Production of beehive coke in the Connellsville and Lower Connellsville region during the week ended May 14 was 108,860 net tons, according to the Connellsville *Courier*. Furnace-oven output was 66,900 tons, a decline of 3,400 tons when compared with the production the week ended May 7. Merchant-oven output was 41,960 tons, a decline of 3,400 tons.

Roads Co-operate in Probe Of Lignite Rates

The railroads operating in North Dakota will co-operate with the State Railroad Board in their investigation of intrastate rates on lignite, according to an announcement from the board after a conference with representatives of the railroads. The leading railroads of the state, the Northern Pacific, Great Northern and Soo Line, offered every assistance in the presentation of data. Hearings are to be held in June at Minot, Devils Lake, Fargo and Bismarck. At these hearings only mine operators and consumers will be heard. No rate experts nor railroad men are scheduled to testify. A general meeting is to follow these regional meetings later in the summer, when rate experts and traffic men will give testimony.

Census of Distribution Yields Accurate Facts For Scientific Business Methods

Results of the first governmental census of distribution, embracing 15,000 business establishments in Baltimore, Md., and supplying new business facts, were described by Alvin E. Dodd, manager, domestic distribution department, United States Chamber of Commerce, in an address recently before the controllers' congress and store managers' division of the Retail Dry Goods Association, meeting in Chicago.

Outlining the methods used in making the first census—a "test" approved by Secretary of Commerce Herbert Hoover—Mr. Dodd said he foresaw the scientific conduct of business operations on the basis of accurate and comprehensive facts.

Some of the questions which will be answered by the new business census, Mr. Dodd said, are: "How many retailers and wholesalers are there? And in the various lines—how many grocers, druggists, hardware merchants, furriers, or coal dealers? How many people are employed in selling goods? How much, roughly, is spent in the city for various commodities?"

Mr. Dodd said governmental figures would show the amount of sales in 45 kinds of establishments and in 80 different commodity classes. Figures also will be furnished on average sales and stocks, retail and wholesale, and upon various types of establishments.

"By using the new business figures in connection with the population figures," Mr. Dodd explained, "we are able to say how many inhabitants there are in the city,

per store, in each of the forty-five classes. And we can calculate the sales per capita."

He declared that the new census "supplies us with facts on practically every phase of distribution. It gives us, first, an exact enumeration of distributors. Next, the most comprehensive figures yet obtained on sales and inventories—in totals from many different lines of business and in corresponding averages per establishment. Then, on retail operation—the number of employees, selling and non-selling, salaries and wages, and average sales per employee.

"Another class of information which it gives us is that on the channels of distribution. Through what types of stores do commodities pass on their way to consumers? Today, more than ever, this is an important question. The complexity of our distribution currents, the multiplicity of channels which merchandise enters, makes this sort of information highly useful.

"Other tabulations will supply us with more light on the methods of distribution. This, also, has become a matter of great interest during the past decade."

"It might be noted that later census figures, showing the trends in methods of distribution, in relative growth of sales, would be desirable. For the first time we could make definite statements, based on fact, concerning the extent of changes in our distribution system. The first figures, however, which we have now, will show the facts of today, and this is something we all want."

Big Equipment Order Placed By N. Y. Central

One of the largest orders for rolling stock to be placed by a railroad in many months was announced last week by the New York Central R.R. The

total, placed within the week, is about \$18,000,000. The order called for 3,500 freight cars, 175 passenger cars, 55 locomotive tenders and 60 high-speed passenger locomotives. The freight-car order included 1,000 70-ton steel hopper cars from the Standard Steel Car Co., 1,000 70-ton steel gondolas from the Pressed Steel Car Co. and 500 70-ton steel gondolas from the General American Car Co.

The Cambria & Indiana has given an order for repairing of 300 hoppers to the Pressed Steel Car Co.

The Louisville & Nashville is inquiring for 250 gondolas.

The Minneapolis, St. Paul & Sault Ste. Marie Ry. has placed orders for 300 hopper cars, dividing the business equally between the Pullman company and the Siems-Stemle Co.

The Illinois Central is inquiring for 4,500 freight cars, 15 switching locomotives and 16 mail, baggage and express cars, involving about \$12,000,000.

The Delaware, Lackawanna & Western R.R. has ordered 300 steel hoppers from the American Car & Foundry Co.

The Reading Ry. is inquiring for 1,000 gondolas.

Coal Produced per Man Employed, 1890-1925, At Mines in the United States

(In Net Tons)

Year	Anthracite				Bituminous			
	Men Employed	Days Worked	Average Tonnage Per Year	Average Tonnage Per Day	Men Employed	Days Worked	Average Tonnage Per Year	Average Tonnage Per Day
1890.....	126,000	200	369	1.85	192,204	226	579	2.56
1895.....	142,917	196	406	2.07	239,962	194	563	2.90
1900.....	144,206	166	398	2.40	304,375	234	697	2.98
1905.....	165,406	215	470	2.18	460,629	211	684	3.24
1910.....	169,497	229	498	2.17	555,533	217	751	3.46
1913.....	175,745	257	520	2.02	571,882	232	837	3.61
1915.....	176,552	230	504	2.19	557,456	203	794	3.91
1917.....	154,174	285	(a) 646	(a) 2.27	603,143	243	915	3.77
1918.....	147,121	293	(a) 672	(a) 2.29	615,305	249	942	3.78
1919.....	154,571	266	570	2.14	621,998	195	749	3.84
1920.....	145,074	271	(a) 618	(a) 2.28	639,547	220	881	4.00
1921.....	159,499	271	567	2.09	663,754	149	627	4.20
1922.....	156,849	151	349	2.31	687,958	142	609	4.28
1923.....	157,743	268	592	2.21	704,793	179	801	4.47
1924.....	160,009	274	550	2.00	619,604	171	781	4.56
1925.....	160,312	182	386	2.12	588,493	195	884	4.52

(a) Heavy washery product.
Compiled by U. S. Bureau of Mines.

Foreign Market And Export News

British Export Trade Weak; Domestic Demand Better

London, England, May 2.—Coal prices continue easy in the British market, though domestic demand has improved and operators are able to make up to some extent for the poor export demand. With the exception of steam coals, orders from Europe are few. Little inquiry comes from France and Belgium, while German competition is being felt in the Italian market. There is a steady business with British coaling depots, Canada and Spain. The Central Argentine Rys. have bought 200,000 tons of best steam large for shipment over the year at near current prices.

Reduced prices in the North of England markets have attracted very little business, and the normal outlet for Newcastle coals, Europe, is as difficult to secure orders from as it has ever been. Northumberland steam coal pits and Durham gas coal pits are operating on short time.

Coal exports from South Wales expanded nearly 29,000 tons last week, aggregate shipments being 437,543 tons. Clearances were slightly larger to France, Spain, coaling depots, Irish Free State and Holland, with a spurt of 27,000 tons in shipments to Italy. In other directions business was smaller, but no serious setback occurred. Compared with the corresponding week of last year, shipments were down 211,000 tons. The clearances last week were divided as follows: France, 140,823 tons; Italy, 70,352; South America, 54,985; Spain, 43,330; Portugal, 18,488; coaling depots, 44,681; Belgium, 5,672; Holland, 2,825; Irish Free State, 11,393; Canada, 1,584; other countries, 30,410. Patent fuel exports were 31,239 tons.

Output by British collieries during the week ended May 7 was 5,072,700 gross tons, a decline of 427,400 tons from the preceding week.

Belgian Trade Stable

Brussels, Belgium, May 12.—The situation in the Belgian market is fairly satisfactory. Household fuels are enjoying a good sale and prices on industrial grades are well maintained. Sales of anthracite grades are large and at good prices. Export demand is increasing and all sizes are benefiting.

There is a fair sale of lean smalls and the situation in semi-bituminous is satisfactory. Coke and patent fuels are quiet. Ovoids, however, are profiting by the demand for household fuels. May 1 prices show a decline of 20 to 40 f. in industrial grades since Feb. 1, while household fuels are more stable.

Extend Coal Sales Syndicate In Polish Silesia

By an agreement signed recently the Polish Silesian Coal Sales Syndicate has been extended until Jan. 1, 1928, according to advices to the Department of Commerce from Assistant Trade Commissioner L. J. Cochrane, Warsaw, Poland. As the result of this action, it is believed in Poland to be likely that the All Polish Coal Sales Syndicate, which expires on May 1, will also be extended to the same date, since the Polish Silesian operators compose the great bulk of the members of the All-Polish Syndicate.

In view of the depression now obtaining in the Polish coal industry, the decision to prolong the sales syndicates is hailed with satisfaction, as it is believed that if the industry were thrown open to free competition, the price cutting which would result would work serious injury to all concerned.

French Market Suffers from Weak Industrial Demand

Paris, France, May 12.—Curtailement of industrial coal consumption in France has reached an acute stage with about 1,500,000 tons stocked at the mines in the Nord and Pas-de-Calais. The last reduction of 6 per cent in miners' wages has fallen short of expectations in combating foreign competition, especially from Great Britain. It is a matter for gloomy speculation as to what the situation would be if freight rates had not been reduced to the northwest and southwest areas. British exporters threaten to ask their government to make reprisals on French products seeking British markets.

Collieries in the Nord and Pas-de-Calais have cut working time one day a week, and it is likely that the practice will be extended. It also is reported that representatives of the pro-

ducers and mine workers will urge that the duty on imported coal be raised.

Demand for household fuels made a notable pick-up recently, so that retailers were able to reduce stocks. As a result there was a gratifying increase in dealers' orders from producers.

Negotiations between German coke producers and French metallurgists are at a standstill. The Germans refuse to recede from a minimum price of 17 m. 85 pf., which the French metallurgical interests maintain they are unable to pay at present. In the absence of a new agreement receipts of German coke will command 21 m. Meantime coke orders have been placed in Belgium and Holland at prices equal to as low as 16.5 m. per ton. Local plants, including independent cokeries, are pushing production.

Export Clearances of Coal Week Ended May 19

FROM HAMPTON ROADS

	Tons
For Nova Scotia:	
Nor. Str. Kalfond, for Halifax.....	2,217
For Quebec:	
Dutch Str. Lekhaven, for Quebec....	6,899
Dan. Str. Nordlys, for Montreal.....	4,981
Dutch Str. Hardenberg, for Montreal	4,500
For Miquelon:	
Nor. Str. Anders, for St. Pierre.....	1,855
For Brazil:	
Br. Str. Stephen, for Pernambuco...	607
For Cuba:	
Dan. Str. Nordstjernen, for Antilla....	2,034
Nor. Str. Sagaland, for Havana....	3,904
For Martinique:	
Nor. Str. Johanne Dybwad, for Fort de France	3,922

Hampton Roads Coal Dumpings*

(In Gross Tons)

	May 12	May 19
N. & W. Piers, Lamberts Pt.:		
Tons dumped for week.....	108,763	132,411
Virginian Piers, Sewalls Pt.:		
Tons dumped for week.....	96,114	118,368
C. & O. Piers, Newport News:		
Tons dumped for week.....	123,061	133,244

*Data on cars on hand, tonnage on hand and tonnage waiting withheld due to shippers' protest.

Pier and Bunker Prices

(Per Gross Ton)

PIERS			
	May 12	May 19†	
Pool 1, New York....	\$5.50@5.75	\$5.50@5.75	
Pool 9, New York....	5.00@ 5.25	5.00@ 5.25	
Pool 10, New York....	4.75@ 5.00	4.75@ 5.00	
Pool 11, New York....	4.50@ 4.75	4.50@ 4.75	
Pool 9, Philadelphia..	4.80@ 4.95	4.80@ 4.95	
Pool 10, Philadelphia..	4.55@ 4.80	4.55@ 4.80	
Pool 11, Philadelphia..	4.35@ 4.70	4.35@ 4.70	
Pool 1, Hamp. Roads..	4.50@ 4.65	4.60@ 4.75	
Pool 2, Hamp. Roads..	4.40@ 4.50	4.40	
Pool 3, Hamp. Roads..	4.20@ 4.30	4.00@ 4.15	
Pools 5-6-7, Hamp. Rds.	4.20	4.25@ 4.40	
BUNKERS			
Pool 1, New York....	\$5.75@6.00	\$5.75@6.00	
Pool 9, New York....	5.25@ 5.50	5.25@ 5.50	
Pool 10, New York....	5.00@ 5.25	5.00@ 5.25	
Pool 11, New York....	4.75@ 5.00	4.75@ 5.00	
Pool 9, Philadelphia..	5.00@ 5.20	5.00@ 5.20	
Pool 10, Philadelphia..	4.80@ 5.05	4.80@ 5.05	
Pool 11, Philadelphia..	4.60@ 4.95	4.60@ 4.95	
Pool 1, Hamp. Roads..	4.65	4.75	
Pool 2, Hamp. Roads..	4.50	4.50	
Pools 5-6-7, Hamp. Rds.	4.30	4.40	

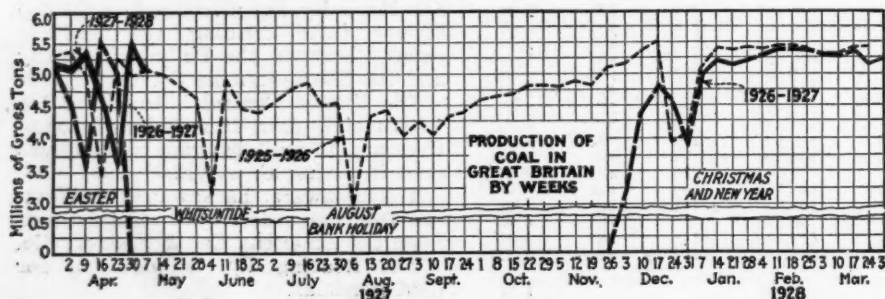
†Advances over previous week shown in heavy type; declines in *italics*.

Current Quotations, British Coal, F.o.b. Port, Gross Ton

Quotations by Cable to Coal Age

	May 14	May 21†
Cardiff:		
Admiralty, large.....	22s. 6d.	23s.
Steam smalls.....	14s. 3d.	16s.
Newcastle:		
Best steams.....		19s.
Best gas.....		17s. 6d.
Best lumps.....		16s. 6d.

†Advances over previous week shown in heavy type; declines in *italics*.



New Companies

The Lewis Coal Co., Pomeroy, Ohio, has been incorporated with a capital of \$25,000 to mine and sell coal in the Pomeroy Bend field. The incorporators are E. J. Lewis of Wellsville; W. G. McClinton, H. E. McFadden, D. A. Brooks and H. L. Cooper of Steubenville, Ohio.

The Bralan Coal Co. of Clarksburg, W. Va., with a capital of \$25,000 has been incorporated. The company has acquired the property of the Dola Coal Co., Dola, W. Va., containing about 120 acres, and will operate it.

The Sunlight Coal Mining Co., Boonville, a stripping concern, continues to take coal leases in Warrick County. The company now has enough land leased to keep busy operating for several years. The company's mine at Boonville has been closed down since the start of the strike on April 1.

The Smokeless Coal Co. of Elk Garden, W. Va., with a capital of \$15,000, has been incorporated. The company will purchase, acquire, lease, hold and manage coal lands and deal in coal. The incorporators are Carroll Pattison, C. Leo Connell, W. F. Coale, G. D. Barrick and R. L. Barrick.

Papers have been filed chartering the Eagle Coal Mining Co., Lindentree, Ohio, with a capital of \$10,000, to mine and sell coal as well as deal in coal lands. Incorporators are Leitha G. Stafford, John C. O'Donnell, Homer I. N. Stafford, Dorothy Minor and Mary N. O'Donnell.

The Smith Coal Co., of 325 Guardian Bldg., Cleveland, Ohio, has been chartered with a capital of 100 shares of stock, no par value designated, to acquire by purchase or lease coal lands and to mine and sell coal. Incorporators are Walter L. Smith, F. K. Pickering, Andrew R. Burney, L. C. Partenfeller and S. Sentena.

The Henrietta Coal Co., Steubenville, Ohio, has been incorporated with a capital of \$50,000 to acquire coal lands and to mine and sell coal. Incorporators are C. H. Muse, A. B. Muse, Carl A. Weinman, A. G. Gardner and H. B. Heaston.

Industrial Notes

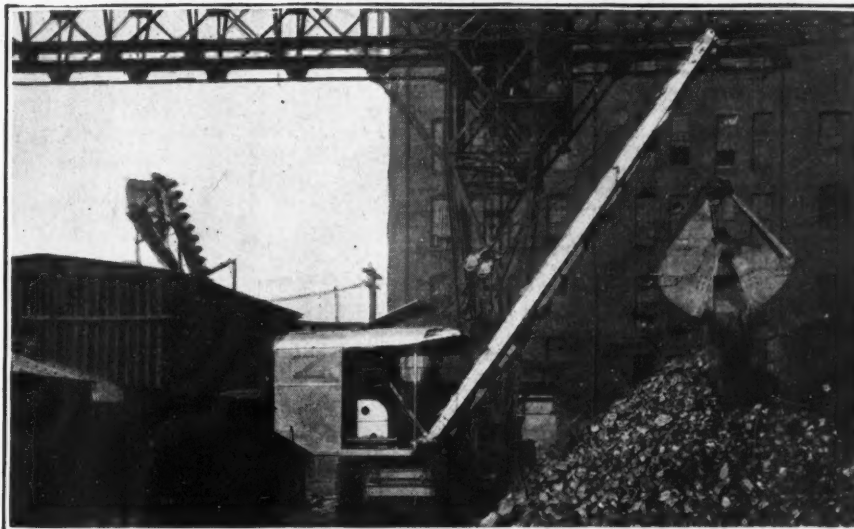
The Detroit Stoker Co., Detroit, announces the appointment of A. Kastello as district sales representative for eastern Canada and Montreal (Quebec) territories, with headquarters at 915 New Birks Building, Montreal.

The Pittsburgh Testing Laboratory, Pittsburgh, Pa., has opened a branch in Youngstown, Ohio, with H. L. Christman in charge.

Barker & Wheeler, engineers, have moved their New York office from 90 West St. to 9-15 Park Place.

The Cincinnati Electrical Tool Co., Cincinnati, Ohio, announces the removal of its Philadelphia office to larger quarters at 716 N. 16th St. H. M. Reynolds is in charge.

New Equipment



Unloading a Car an Hour

These cranes are quickly moved from place to place and will handle as many and varied jobs as can be assigned to them. For instance, they can be used to unload sand or coal into and out of storage piles, etc. They also may be adapted to unloading such material as pipe, rails and timber.

Cranes Mounted on Motors Offer Many Economies

Small cranes, mounted on motor trucks to give them mobility, have rapidly grown in favor in recent years. They are particularly adaptable to handling jobs too small for larger machines and too large to be efficiently disposed of by hand. Many coal dealers have adopted this type of crane and operating companies will find that it offers many advantages and has a wide variety of uses. It can be easily moved from place to place, and will probably find its greatest application in unloading material such as sand, timber, coal, etc.

Among the advantages claimed for this type of equipment are economy of operation, ease of movement, and great speed in handling materials. A study of a large number of installations is said to have shown that this type of equipment can easily unload a car in an hour. The Consumers Co. of Chicago, Ill., which operates four Universal truck cranes, unloads an average of from 12 to 14 cars per day with each crane. Recently 16½ cars of bulk materials were unloaded in 10 hr. Cranes of this type are equipped with ½ to ¾ cu.yd. buckets and unload directly into trucks or to stock piles.

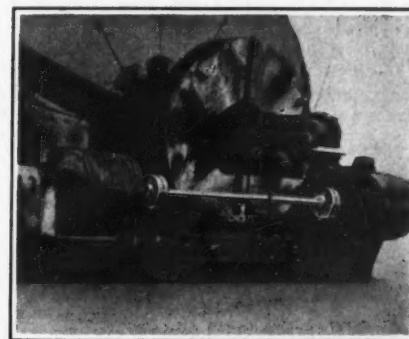
When unloading to stockpiles, the crane delivers the material 15 to 20 ft. away from the cars. When unloading cars by hand it usually requires a second handling to move the materials that distance. There is sufficient clearance between the cars and the stockpile to permit trucks to pass. Here they can be easily loaded by the crane either from the car or from storage.

A 5-ton truck can be loaded in from two to four minutes. This reduces the time that the trucks are standing and,

consequently, fewer trucks are required. As a result, trucking expense is reduced. These cranes are manufactured by the Universal Crane Co., 914 Swetland Bldg., Cleveland, Ohio.

Unsupported Shafts Driven By Flexible Couplings

Although popular opinion has long held to the belief that an unsupported shaft could not be successfully driven through flexible couplings, the manufacturers of a well-known line of



It Can Be Done

Satisfactory driving of unsupported shafts through flexible couplings was long thought impracticable. However, this has finally been accomplished, as here illustrated on a continuous filter, through the use of the couplings described in the accompanying article.

continuous automatic filters have successfully applied such couplings, manufactured by the Ajax Flexible Coupling Co., Westfield, N. Y., to filter operation.

The illustration shows an unsupported shaft on the drive end of a continuous filter used for dehydrating ce-

ment slurry. The motor, mounted on the right side of the filter, drives a shaft 4 ft. long through an Ajax coupling. This shaft is fixed to another similar coupling on the left side which connects with a speed reducer.

The successful driving of this unsupported shaft is attributable to the precision-made parts of the coupling. Rubber bumpers, ground to size, perform the double duty of effecting complete insulation and absorbing shocks. The bumpers are firmly cemented around bronze bushings and into the holes in the flanges. They are thus protected from dirt, oil and water.

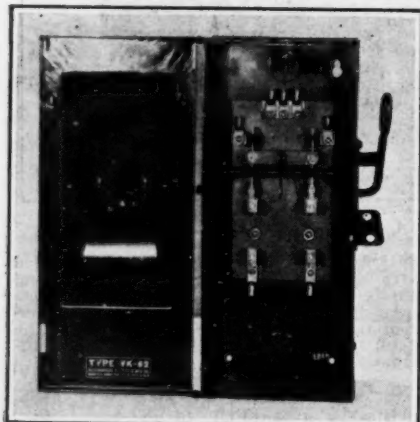
Hardened, high-carbon steel pins or drive-studs are the connecting media. They are ground to limits of 0.001 in. to assure absolute alignment, eliminate friction and prevent binding and vibration. Oilless bronze bushings, impregnated with graphite for self-lubrication, and fitted into the bumpers, furnish a bearing for the steel pins.

These couplings are made by means of jigs and master dies so as to insure accuracy and interchangeability of parts. The engineers who designed and installed the drive shown believe its success is due to the unusual precision with which the couplings are made.

2-Pole, 3-Wire, Switches Require Small Space

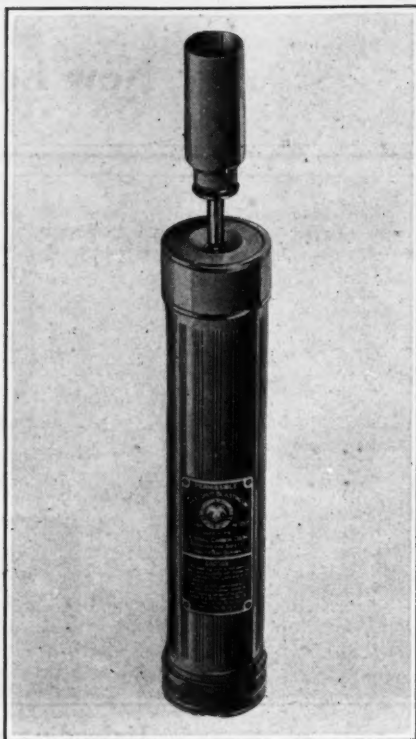
Two-pole switches, with a solid third wire, for use on three-wire grounded systems, have been developed recently by the Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa. They may be obtained in sizes varying from 30 to 600 amp. Their design provides an economic switch arranged to utilize the advantages of reduced size. This decrease is made possible by the use of a solid third wire which eliminates the third switch blade. The size is thus reduced to that of a standard two-wire switch.

The 30-amp. switch is of the "00" type, the 60-, 100- and 200-amp. sizes are of the WK-62 type, and the 400- and 600-amp. sizes of the WK-60 type. When it is desired to mount a meter in conjunction with the switch, all the types up to 200 amp. may be supplied with an end, or removable-end.



Economical of Space

Although designed for three-wire grounded systems, this switch has but two poles, the third wire being solid. On this account, it is of such size that it requires no more space than a standard two-wire switch.



"Single Shooter" of Unique Design

No more fussing with fuses, no more waiting while fuses burn, no more misfires or delayed shots from fuse trouble—these are a few of the advantages claimed for this electric shot firing unit which is small, compact and light in weight.

Electric Shot-Firing Unit Safe and Convenient

What is said to be the most convenient and the safest battery-powered shot-firing device ever offered, has recently been announced by the National Carbon Co., Inc., of New York. This machine, known as the Eveready Shot-Firing Unit has been approved by the U. S. Bureau of Mines. Its unique features also make it suitable for use on the surface, in quarries, in stump blasting and, in fact, wherever blasts are fired one at a time.

It is small, compact and light in weight and, as no fuses are required, dangers from misfires and delayed shots are eliminated. This device, operating on dry batteries which are easily renewed, is said to be absolutely safe as the shots cannot be fired accidentally. The wires leading from the cap are fastened to a special plug and, in order to fire a shot, it is necessary to insert this plug in a small socket in the end of the device and to hold it there against the pressure of a spring. The plug cannot be left in contact as the spring forces it out of connection as soon as it is released by the hand.

The device is equipped with a convenient ring hanger on the bottom cap for hanging on the belt or on a nail or hook on the wall.

Recent Patents

Rock-Drilling Device; 1,620,885. Elmer G. Gartin, Claremont, N. H., assignor to Sullivan Machinery Co., Chicago, Ill. March 15, 1927. Filed Apr. 10, 1922; serial No. 551,326.

Coming Meetings

American Wholesale Coal Association. Annual convention June 1-3, Toronto, Canada. Secretary-treasurer, R. B. Starek, Chicago Temple Bldg., Chicago, Ill.

Pennsylvania Retail Coal Merchants' Association. Annual convention, Wilkes-Barre, Pa., June 1-3. Secretary, W. M. Bertolet, Reading, Pa.

National Retail Coal Merchants Association. Annual convention June 6-8, Detroit, Mich. Resident vice-president, Joseph E. O'Toole, Washington, D. C.

Association of Iron and Steel Electrical Engineers. Annual convention in conjunction with the Iron and Steel Exposition, at Pittsburgh, Pa., June 13-18. Secretary, John F. Kelly, Empire Bldg., Pittsburgh, Pa.

New England Coal Dealers' Association. Annual meeting June 14-16, Hotel Griswold, New London, Conn. Executive secretary, E. I. Clark, Boston.

Colorado and New Mexico Coal Operators Association. Meeting at Boston Building, Denver, Colo., June 15. Secretary, F. O. Sandstrom, Denver, Colo.

National Coal Association. Annual meeting June 15-17, at Edgewater Beach Hotel, Chicago. Executive Secretary, Harry L. Gandy, Washington, D. C.

Illinois Mining Institute. Summer meeting June 16-18 at La Salle, Ill., by Steamer Cape Girardeau. Secretary, Frank F. Tirre, 603 Fullerton Bldg., St. Louis, Mo.

American Society for Testing Materials. Thirtieth annual meeting, French Lick Springs Hotel, French Lick, Ind., June 20-24. Secretary, C. L. Warwick, 1315 Spruce St., Phila., Pa.

American Institute of Electrical Engineers. Summer convention, June 20-24, at Detroit, Mich. Regional meeting, May 25-27, Pittsfield, Mass. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

Mining Society of Nova Scotia. Annual meeting at Baddeck, Nova Scotia, Canada, June 21-22. Secretary-Treasurer, E. C. Hanrahan, Sydney, N. S., Canada.

International Chamber of Commerce. Fourth congress at Stockholm, Sweden, June 27 to July 2.

Michigan-Ohio-Indiana Coal Association. Annual convention at Cedar Point, Ohio, June 28-30. Secretary, B. F. Nigh, Columbus, Ohio.

Illinois and Wisconsin Retail Coal Dealers' Association. Annual convention, the Hotel Pfister, Milwaukee, Wis., June 28-30. Managing Director, N. H. Kendall, 706 Great Northern Bldg., Chicago, Ill.

Annual First-Aid Meet for championship of Pennsylvania (open to mining and industrial teams), Ebensburg Fair Grounds, July 9. Superintendent, H. D. Mason, Jr., Box 334, Ebensburg, Pa.

Second (Triennial) Empire Mining and Metallurgical Congress opens at Montreal, Can., Aug. 22 and continues to Sept. 28, under the auspices of the Canadian Institute of Mining and Metallurgy. Secretary, George C. Mackenzie, 604 Drummond Building, Montreal, Can.